



Comparing vocational education and training qualifications

**Towards methodologies for analysing
and comparing learning outcomes**

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The **European Centre for the Development of Vocational Training** (Cedefop) is the European Union's reference centre for vocational education and training, skills and qualifications. We provide information, research, analyses and evidence on vocational education and training, skills and qualifications for policy-making in the EU Member States.

Cedefop was originally established in 1975 by Council Regulation (EEC) No 337/75. This decision was repealed in 2019 by Regulation (EU) 2019/128 establishing Cedefop as a Union Agency with a renewed mandate.

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Foreword

According to its Founding Regulations (EU Council and Parliament 128/2019), Cedefop's primary task is analysing trends in vocational education and training, skills and qualification policies and systems, and providing comparative analysis across countries.

This Cedefop reference report directly addresses this task and seeks to strengthen the ability of Cedefop to analyse and compare the content and profile of VET programmes and qualifications. Building on the results from the 2017-20 project *Comparing vocational education and training qualifications: towards a European comparative methodology*, the report provides the basis for future work, offering policy-makers and researchers a toolbox for analysis and comparison.

Our ability to strengthen the quality and relevance of European VET depends on the way we balance, combine and deliver different forms of knowledge, skills and competences, directly reflecting the needs of labour markets and societies. Deciding on the content and profile of VET programmes and qualifications lies at the heart of any VET strategy, whether developed at local, national or European level.

While much effort has been invested in analysing and forecasting the changing skills and competence needs of labour markets, less attention has been given to the way VET providers and systems respond to these needs. Strengthening of VET requires a combined perspective, allowing for continuous feedback between the labour market and society, on the one hand, and the VET providers and systems on the other. The methodologies outlined in this report help to strengthen this feedback loop.

The research underpinning this report builds on the following observations. First, the development of VET programmes and qualifications cannot take place in a national vacuum. While skills and competences always need to be adjusted to national needs, broad international developments influence skills demand and, consequently, supply. To be able to respond to these changes and challenges it is essential to develop robust comparative methods

allowing stakeholders to learn from one another. Increasing the relevance and quality of own programmes and qualifications benefits from observing and comparing the choices and priorities of others.

Second, European VET systems have, during the past two decades, changed the way they define and describe qualifications and programmes. The focus on learning outcomes – on what a learner is expected to know, be able to do and understand – provides us with a much more direct insight into national content priorities and intentions. The current report builds on this perspective and explores its potential.

Third, the focus on VET content and learning outcomes points to a dilemma increasingly facing national and European VET systems. Given the current speed of technological, economic and societal change, how can we keep VET programmes and qualifications updated, how can we avoid delivering outdated skills and competences? This report demonstrates the importance of differentiating between different types of knowledge, skills and competences. While technical skills change rapidly, basic knowledge (for example in maths or languages) and key competences (for example problem-solving, learning to learn, and communication) are more stable. Preparing VET for the future requires a balancing of these types of skills, systematically making individuals able to cope with change. The elaboration of reference points for analysis and comparison of VET content addresses this need for diversified understanding. The message of the report regarding the positive potential of the European ESCO initiative should especially be noted.

The research underpinning this report is an investment in future capabilities, making it possible for policy-makers and researchers to carry out in-depth analysis and comparison of the knowledge, skills and competences being delivered by national and regional VET providers and systems. The lessons learned from this work forms an important part of the efforts to improve the quality and relevance of VET in Europe.

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Contents

Foreword	4
Executive summary	12
1. Introduction	23
1.1. Aim of this report	23
1.2. Relevance of methods for analysing and comparing VET qualification content	24
1.3. Key objectives, main research questions and methodological approach.....	26
1.4. Overview of this report	28
2. Methodological developments: taking stock	29
2.1. Introduction	29
2.2. Reference points for analysing and comparing VET qualifications content	30
2.2.1. Reference points and systems: introduction	30
2.2.2. The use of reference point or systems in the different strands of the study	33
2.2.3. Lessons learned	34
2.2.4. Taking stock of developments within ESCO	41
2.2.5. Preliminary conclusions	81
2.3. Data sources for national VET qualifications	82
2.3.1. Lessons learned	82
2.3.2. Preliminary conclusions	85
2.4. Digital technologies for analysing and comparing qualifications data	86
2.4.1. Lessons learned	86
2.4.2. Preliminary conclusions	88
2.4.3. Other relevant activities	89
2.5. Completing the feedback loop between VET and the labour market.....	93
2.5.1. Lessons learned	93
2.5.2. Preliminary conclusions	100
2.6. The importance of learning outcomes going forward.....	102

3. Potential applications and use cases	104
3.1. Introduction	104
3.2. Supporting VET qualification quality, relevance and excellence ..	108
3.2.1. Introduction.....	108
3.2.2. Use case: improving the content and structure of VET qualifications.....	109
3.2.3. Use case: Improving the relevance of VET qualifications	112
3.3. Transferability of learning outcomes and flexible learning pathways: national and international context.....	120
3.3.1. Introduction.....	120
3.3.2. Use case: supporting the levelling of VET qualifications ..	121
3.3.3. Use case: supporting mobility in VET	123
3.3.4. Use case: exploring opportunities for flexible learning pathways.....	127
3.3.5. Use case: applying for a job in another country with a VET qualification	129
3.4. Development of European vocational core profiles.....	131
3.4.1. Introduction.....	131
3.4.2. Use case: supporting the development of European vocational core profiles	133
4. Conclusions and recommendations	136
4.1. Conclusions.....	136
4.1.1. Conclusions related to research question 1	136
4.1.2. Conclusions related to research question 2	138
4.1.3. Conclusions related to research question 3	144
4.2. Recommendations.....	147
4.2.1. Recommendation 1: Conduct further conceptual work ...	148
4.2.2. Recommendation 2: Identify needs and explore feasibility of application	149
4.2.3. Recommendation 3: Disseminate results in an attractive and accessible way.....	150

Acronyms	152
References	153
Annex 1: The research team	157
Annex 2: Illustrating data	158

Tables, figures and boxes

Tables

1.	Reference points used for testing in WA1	33
2.	Mapping table for healthcare assistant	48
3.	Core learning outcomes from the mapping against the healthcare assistant profile	52
4.	Mapping table for ICT technician	56
5.	Core learning outcomes from the mapping against the ICT technician profile	66
6.	Combined mapping table for ICT technician and healthcare assistant – transversal skills and competences	70
7.	Seven potential use cases, their purpose and specific example	140
A 1.	Mapping of health care assistant qualifications to the ESCO occupational profile	160
A 2.	Typology for employer reflection survey	170
A 3.	Employer reflection survey – questionnaire for VET providers	172
A 4.	Employer reflection survey – questionnaire for VET graduates	174
A 5.	Employer reflection survey – questionnaire for employers	177
A 6.	Using the VQTS/HCEU competence matrix for comparing healthcare assistant qualifications	180
A 7.	Using the WorldSkills standards specifications for comparing IT technician qualifications	190
A 8.	Using an ESCO occupational profile for comparing IT technician qualifications	199
A 9.	Mapping of health care assistant qualifications to the ESCO occupational profile	204
A 10.	Core learning outcomes identified based on the mapping of healthcare assistant qualifications to the ESCO occupational profile	214

Figures

1. Key research questions for WA4	16
2. World reference levels	30
3. Mapping exercise	46
4. Mapping exercise, supported by the learning outcomes linking tool ..	54
5. Examples of employer reflection surveys	67
6. VQTS-based competence matrix	80
7. Learning outcomes feedback loop	94
8. Key research questions for WA4	96
9. World reference levels	100
10. Mapping exercise	107
11. Mapping exercise, supported by the learning outcomes linking tool	118
12. Examples of employer reflection surveys.....	139

Boxes

1. Key research questions for WA4	27
2. World reference levels	31
3. Mapping exercise	35
4. Mapping exercise, supported by the learning outcomes linking tool ..	91
5. Examples of employer reflection surveys	114
6. VQTS-based competence matrix	122

Executive summary

Methodologies for analysing and comparing VET qualifications

This report brings together research findings from three separate, but related, studies conducted in the framework of the Cedefop project *Comparing vocational education and training qualifications: towards a European comparative methodology* between 2019 and 2020. The project explored a specific approach to mutual learning: It focused on methodologies for the in-depth analysis and comparison of the profile and content of VET qualifications. The purpose of these methodologies is not to promote standardisation and harmonisation of qualifications and their learning outcomes but to provide countries with a better evidence basis on which systematically to judge their own priorities and solutions and to increase the quality and relevance of their national VET qualifications.

The first part of this project explored and tested potential reference points and focused on their usability for analysing and comparing qualifications. The second part explored the key sources for data on national qualifications, particularly related to their content and profile and to their relevance for the cross-national comparison of qualifications; it also explored the use of new digital technologies to support the automated gathering, structuring analysis of data on qualifications, the mapping to a reference point, and the comparison of qualifications. The third part of the project specifically focused on improving the relevance of qualifications: it looked for ways to gather and analyse data from employers and the labour market to support the review and renewal of VET qualifications (Cedefop, 2021).

The research activities of the overall project included 10 countries (Austria, Bulgaria, Denmark, Finland, France, Ireland, Lithuania, the Netherlands, Spain, and United Kingdom-England) and focused on two qualification profiles: healthcare assistants (assistant nurses, practical nurses) and ICT service technicians.

For this final work assignment, as a first step the findings and lessons learned from the previous research phases were summarised and relevant recent policy initiatives and activities (mainly of DG Employment, social affairs and inclusion and Cedefop) were explored and linked to these developments,

where appropriate. Next, potential use cases for the methodologies explored were identified and described (using material developed in the project to illustrate methodologies) to inspire further developments. In a third step an online workshop with country experts was organised to discuss the purposes of analysing and comparing qualifications (focusing on intended learning outcomes) and the methodological approaches identified. The workshop also considered the feasibility of applying the methodologies, as illustrated in the potential use cases, in their national contexts. This resulted in a report providing descriptions of use cases and recommendations on how the methodological elements can be further developed to strengthen the quality and relevance of VET qualifications.

The analysis and comparison of qualifications should not be an end in itself or merely satisfy research interests. Rather, it is intended in a broader sense as an approach to support the review and renewal of national qualifications and to support the transferability of learning outcomes and flexible learning pathways. This report, therefore, explores, at a conceptual level, potential use cases or applications of the methodologies explored. It discusses for what purposes, for whom and by whom these methodologies could be used to contribute to the achievement of different objectives, which methods and instruments are already available, which need to be adapted and which conditions need to be met for their potential application. Further, the added value of applying these methods in specific contexts is discussed. However, the use cases do not offer ready-made solutions for specific problems and needs. This report is oriented towards providing technical support and discussing options for possible future solution steps to support policy processes with regard to specific needs. It discusses three research questions:

- (a) how can methodologies for analysing and comparing qualifications support European cooperation in VET and national stakeholders in strengthening the quality and relevance of VET qualifications?
- (b) which purposes, target groups and stakeholders for analysing and comparing qualifications in this context can be identified (use cases)?
- (c) what is needed in terms of methodologies and necessary conditions to implement the use cases?

Conclusions

Conclusion 1

The use of learning outcomes in describing the content and profile of VET qualifications opens up opportunities for applying methodologies for analysing and comparing those qualifications that contribute to improving relevance and supporting qualification transferability.

The study showed that VET qualifications described in terms of learning outcomes can be analysed and compared across profiles, sectors and countries, and that analyses and comparisons can even be conducted on the intended and acquired learning outcomes. Learning outcomes are central to this as they allow for a breakdown of qualifications that can be systematically applied and analysed in different (national VET) contexts; learning outcomes descriptions also allow for the analysis and better understanding of the content of qualifications, their orientations in relation to labour market access or further learning.

The comparative approaches that use learning outcomes as a basis allow reflection on the content and orientations of VET qualifications in different contexts and offer insights that can be used to improve the relevance of VET qualifications. Learning-outcomes-based methodologies for analysing and comparing VET qualifications also allow multiple stakeholders to increase their engagement in reviewing and renewing VET qualifications, and allow for using the outcomes of this exercise in other processes such as (career) guidance to VET students/graduates, supporting transnational mobility of qualifications and labour mobility.

Conclusion 2

A methodology for analysing and comparing qualifications based on learning outcomes can be supported by the use of a reference point that includes a set of skills appropriate for the respective purpose for the analysis and comparison of qualifications.

As the content of VET qualifications is constantly changing under the influence of labour market, technological, pedagogical, societal and political developments, there is no fixed point at which the content of VET qualifications can be compared to this yardstick. However, methodologies for analysing and comparing the content of VET qualifications benefit from an agreed reference point to allow for the mapping and comparison of qualifications in different contexts. Such a reference point is only a ‘translation device’ and a methodological tool; it should not be seen as anything more.

The purpose of applying methodologies based on learning outcomes and the specific use case determine the demands placed on the reference point. Each purpose of analysing and comparing qualifications, and each context in which this is done, places different demands on the reference point. These requirements can relate to the applicability of the reference point in different national contexts (for instance offering different linguistic versions), but they can also relate to the structure and hierarchy applied in the set of skills used in the reference point, level of detail, types of skills included (occupational or transversal), or whether different performance levels are expressed in the set of skills included. The research found that the ESCO skills pillar is a promising reference system that may be applied in many contexts, albeit with some specific adaptations depending on the specific purpose and context of use. However, ESCO is far from being perfect, it needs an improved conceptual basis and continuous updating and further development.

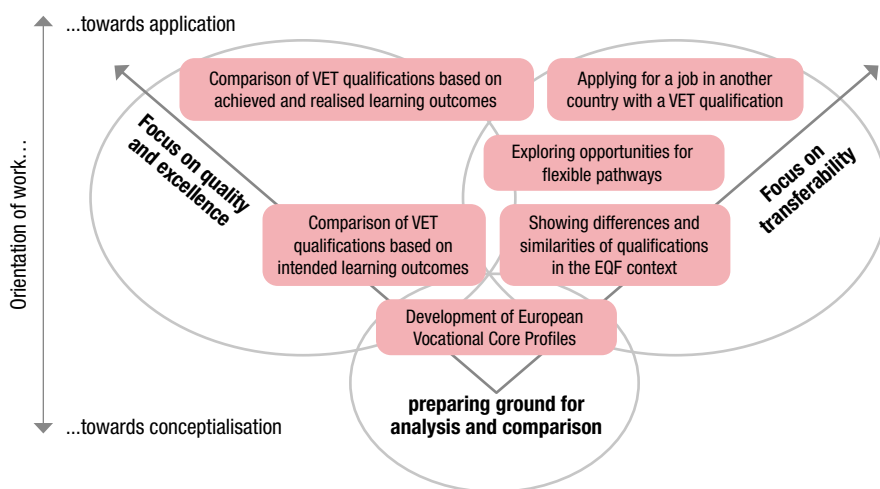
Conclusion 3

The study identified seven potential use cases for methodologies for analysing and comparing the content of VET qualifications, based on learning outcomes; while not immediately applicable, they can orient future developments in using these methodologies for improving the relevance of VET qualifications and supporting transferability of VET qualifications and their learning outcomes.

The research project identified a variety of contexts in which comparative methodologies can be applied, contributing to improvements of the quality and relevance of the content of VET qualifications, improvements in transferability of qualifications and learning outcomes across borders and sectors, and developments towards European vocational core profiles. Within these broad purposes, seven specific use cases were identified for potential appli-

cations of the methodologies explored in the future. These potential use cases can be positioned in relation to the orientation towards conceptualisation or towards application and in relation to the three purposes for comparison.

Figure 1. **Potential applications and use cases situated within the analytical framework**



Source: Cedefop.

It should be emphasised, however, that these potential use cases are to be seen as conceptual considerations that can serve relevant stakeholders as a basis for further development. At present, it is not possible to offer ready-made tools and solutions, not least because ESCO, the reference system used in several of the applications to support the analysis and comparison of VET qualifications, as well as other reference points and related technical solutions, are still work in progress. Moreover, conceptual challenges and shortcomings of the approaches also need to be considered.

Conclusion 4

National VET system characteristics and developments greatly influence the relevance and applicability of the potential use cases for methodologies to improve the relevance of VET qualifications and to support transferability of VET qualifications.

There are, besides generic challenges related to applying use cases (see next conclusion), specific national VET characteristics that impact the relevance and applicability of the cases. This depends on the particular application, but it can be generally observed that some countries are less likely to use the methodologies explored and developed. As VET systems are not static and are subject to periodical reforms, methodologies for analysing and comparing VET qualifications and the potential use cases can show their relevance at a later stage when national stakeholders seek instruments and approaches to support their reform agendas.

Conclusion 5

Generic challenges associated with applying the use cases and the methodologies for analysing and comparing VET qualifications relate mainly to the quality of the reference point (set of skills included), to the learning outcomes descriptions of qualifications, the issue of expressing the level of proficiency of learning outcomes, and to including context features in comparisons.

When further elaborating on the use cases, there are a number of generic challenges that need to be addressed. The challenges are slightly different for each use case, but refer to similar problems.

- (a) Set of skills included in a reference point: each use case puts different demands on the reference point and the set of skills included. Further conceptual work is required for each use case to support decisions related to the content, scope and orientation of the reference point.
- (b) Learning outcomes descriptions of qualifications: a key factor for successfully applying comparative methodologies is the extent to which, and how, the qualifications are described in terms of learning outcomes. While substantial progress has been made during recent years, descriptions of qualifications still need to be improved in many cases to serve better the needs in this context.
- (c) Level of proficiency expressed in learning outcomes: in several potential use cases, the ability to distinguish the proficiency levels of learning outcomes is desired. While there are reference points that allow differentiating competence areas and higher- and lower-level abilities (such as the VQTS-based competence matrices), such reference points are not

systematically available, are available for a few occupational fields, and in few languages only.

- (d) Contextual factors not expressed in learning outcome statements: a crucial challenge for applying comparative methodologies based on learning as expressed in the use cases, is that national contexts, conceptualisations, philosophies and approaches underlying the design of VET qualifications, the descriptions of learning outcomes and the assumptions behind these descriptions are not explicitly expressed in the learning outcome statements. This could result in identifying similarities between qualification descriptions from different countries while there are underlying key differences in terms of what these descriptions actually mean in their national context. This is a key conceptual challenge to be considered in any further developments.

Conclusion 6

To ensure zones of mutual trust based on comparative methodologies, these methodologies need to be based on solid research and evidence. This could be associated with cost implications that could exceed the potential benefits.

The background of comparative methodologies lies in the development of the European qualifications framework (EQF) and the idea that, within increased transnational mobility, there is a need to establish zones of mutual trust related to qualifications. Zones of mutual trust relate to trust in the levelling of VET qualifications, but also for making zones of mutual trust applicable to end-users (citizens and employers) to better understand the content of qualifications. The comparative methodologies can support the development of zones of mutual trust, but only if they result in useful outcomes and benefits for end-users. This can only take place when the comparisons are based on solid research approaches, sound conceptual clarifications and solid evidence on similarities and differences between qualifications.

Related to this, comparative methodologies could be associated with cost implications that exceed their potential benefits. Many of the potential use cases require investment to become fully operational. Such investments may include further conceptual clarifications and conceptual development of the reference points and tools for making national qualifications descriptions suitable and accessible to comparison; implementing support structures

to make the outcomes of the comparisons available for appropriate stakeholders and users, and supporting structures to keep reference points, national descriptions and the comparison of qualifications continuously up to date may also be needed.

Recommendations

The recommendations below do not focus on fully implementing the use cases, but more on preparing the conceptual ground for applying these methodologies and for further research on them and the use cases.

Recommendation 1: Conduct further conceptual work

The research conducted in this project points to several needs for improvements related to reference points and sources of information on qualifications, as well as to further conceptual work related to applying the learning outcomes approach for analysing and comparing qualifications and using digital tools for supporting comparison.

- (a) Further development of reference points: the main advantages of ESCO include the fact that it has wide coverage of occupations and a multilingual approach. However, the shortcomings of ESCO, as identified in this study but also in other activities, need to be addressed and its conceptual basis improved. There are a number of aspects in which ESCO requires further development, including the conceptual foundation for the set of skills included per occupation and the integration of transversal skills. It is also recommended to explore approaches to include proficiency levels related to the skills included in ESCO. Even if ESCO has turned out to be the most promising reference system for many reasons, this is not to disregard the fact that other reference points may be more suitable for certain purposes of use. Conceptual development should, therefore, not focus exclusively on ESCO.
- (b) Further development of, and conceptual work on, sources of information on qualifications: although much has already been achieved in this respect, further work needs to be done regarding the transparent description of qualifications. In particular, further efforts are needed to develop common structures of presenting qualifications in the European context (e.g. in qualification databases, as suggested by the EQF Recommendation). It is also recommended to explore further and develop learning outcomes descriptions and the concept of qualifications (without interfering with national priorities) as more clarity is needed on what role learning

outcomes play in the overall qualification (e.g. do they refer to the overall profile or to parts/units of a qualification) and on what actually is a qualification (e.g. how to deal with qualifications that have a high number of optional parts; what could be the role of emerging microcredentials).

- (c) Further conceptual work related to using the learning outcomes approach for analysing and comparing qualifications: the use of learning outcomes provides many opportunities but – as the research has shown – there are also many challenges and ambiguities that need to be addressed to improve this approach and its use for comparing qualifications. Further considerations would be important, for example, related to how contextual factors; these are of crucial importance for understanding qualifications and how they are embedded in the national context, and could be better considered when interpreting the outcomes of comparisons. Learning outcomes are not neutral statements and need to be interpreted within the context for which they have been developed. Understanding this context is essential in understanding the outcomes of the analysis. Contextual factors that could be taken into account refer particularly to the design approach and the philosophy behind developing learning outcomes. This relates to the guidelines used for developing learning outcomes, understanding the level at which learning outcomes are described for a qualification and the structure in which they are described. The following contextual aspects should also be considered: the role qualifications play in linking VET to the labour market, the extent to which labour market stakeholders are involved in the development of qualifications, and the roles a VET qualification has in the labour market and for society.
- (d) Further work on digital tools to support the analysis and comparison of qualifications: if the methods for analysing and comparing qualifications based on learning outcomes are to be used more widely, it is not possible to rely solely on manual mapping of learning outcomes to reference points. This would require far too many resources. There is a need for solutions that are at least semi-automatised. It is therefore recommended to explore further the use of artificial intelligence and digital tools, bearing in mind that it will not be possible in the near future to achieve valid results entirely without human intervention when using digital tools to compare qualifications.

Recommendation 2: Identify needs and explore feasibility of application

In order to ensure the engagement of stakeholders, it is recommended to explore in which countries, in which VET subsystems, in which economic sectors, and from which stakeholders there actually is an interest in applying the methodologies developed. The interest could be due to the provision of specific solutions to their current or (anticipated) future needs. It is also possible that only by reflecting on the possible use cases they will get ideas about the extent to which these methodologies could be helpful for them.

The potential use cases presented in this report are primarily aimed at orienting reflections on how comparative methodologies can support services to improve the relevance of qualifications and to support flexible pathways, mobility and career guidance. They are not directly applicable and might not always be relevant or needed in a given national or sectoral context. Further research is needed to explore which conditions need to be in place and in which contexts the use cases are relevant and add value to the existing structures and instruments. Aspects to be taken into account particularly concern:

- (a) would a specific use case solve an existing problem/challenge for which there are no other national/sectoral solutions available?
- (b) what conditions need to be in place to have the use case solve the problem?
- (c) would the benefits of developing and implementing the use case outweigh the costs?

This approach would help to identify those areas and sectors that have an interest in the further conceptual work described above and that can also be involved in these activities to generate ownership. Such exploration should also include an estimation of the resources needed and a clarification of the support structures required. Subsequently, it would be necessary to provide the corresponding resources and the required support. It is recommended to carry out a cost-benefit assessment to clarify to what extent the application of the methodologies actually represents an advantage over other approaches.

This approach could also help to discover the reasons why some stakeholders clearly express a lack of interest in the methodologies, such as other priorities or better solutions in place. It could also be used to identify other solutions and approaches that could be integrated, or at least considered, in these methodologies.

Recommendation 3: Disseminate results in an attractive and accessible way

In order for stakeholders and beneficiaries (such as VET authorities, VET providers, employers, career guidance professionals) to make use of the methodologies developed, they need to be informed about the benefits involved for them in a way that sparks their interest. Potential use cases and (further developed and improved) methodologies and tools need to be tailored to their specific needs and presented in an attractive and accessible way.

One element of this approach could be to develop a database that is structured according to the purposes for which these methodologies can be used (and which should be closely linked to the needs of the potential users and beneficiaries). This database could be designed to allow different search options, such as for specific purposes, context of use, profile of users and beneficiaries, reference points applied and examples presented.

CHAPTER 1

Introduction

1.1. Aim of this report

This publication presents results of a study that was carried out between 2019 and 2021 and explored a specific approach to mutual learning: it focused on methodologies for the in-depth analysis and comparison of the profile and content of VET qualifications. The purpose of these methodologies is not to promote a standardisation and harmonisation of qualifications and their learning outcomes but to provide countries with a better evidence basis on which systematically to judge their own priorities and solutions and increase the quality and relevance of their national VET qualifications.

The **complete study comprises four separate but closely related parts**:

- (a) countries describe their qualifications and the learning outcomes included in them in different ways; for a comparative methodology a neutral terminological reference point is important. The first part of the study, therefore, aimed to explore and test potential reference points and focused on their usability for analysing and comparing qualifications;
- (b) two key objectives were set for the second part of the study:
 - (i) to explore the key sources of data on national qualifications, particularly related to their content and profile and to their relevance for the cross-national comparison of qualifications; specific attention was given to the question of to what extent national qualifications databases can support the comparison of VET qualifications;
 - (ii) to explore the use of new digital technologies to support the automated gathering, structuring analysis of data of qualifications, the mapping to a reference point and the comparison of qualifications; the role of the multilingual classification ESCO in supporting gathering, structuring and classifying qualifications data was particularly explored;
- (c) the third part specifically focused on improving the relevance of qualifications and looked for ways to gather and analyse data from employers and the labour market for supporting the review and renewal of VET qualifications (Cedefop, 2021). It aimed to address the link between the intended outcomes of the VET system, which was the focus of parts one and two of the project, and the actual outcomes experienced by employers and

the labour market, by developing and pre-testing an employer reflection survey.

- (d) the final part, this publication, is bringing together these different elements. It takes stock of the lessons learned during the previous research phases and of further relevant developments and introduces ‘use cases’ as potential orientations or applications of the methodologies developed and tested. They are aimed at supporting stakeholders in further reflecting on the methodologies explored, by showing their potential, their opportunities and limitations, and inspiring them to further developments based on their needs.

Before presenting the specific objectives and research questions for this report, we will outline the policy background that underpins the relevance of methods for analysing and comparing the content of VET qualifications.

1.2. Relevance of methods for analysing and comparing VET qualification content

Education systems have faced various external pressures, or megatrends, shaping the future demand for skills, including fast-moving technologies (e.g. digitalisation), labour markets, demographic trends (the ageing population, increased longevity, and the possibility that people will stay in the labour market for longer) and migration (OECD, 2019). This requires individuals to engage in learning throughout their working lives if they are to have rewarding careers, or even to remain employable. Reskilling and upskilling of ‘the existing workforce are essential levers to fuel future economic growth, enhance societal resilience in the face of technological change’ (World Economic Forum et al., 2018, p. 17). In order to achieve this, VET provision needs to be constantly renewed and modernised in response to these rapidly changing policy needs and priorities. It is also seen as important to balance stability and a certain degree of flexibility allowing for responsiveness. Such responsiveness of national VET systems requires, for example, high quality evidence on trends in the labour market and skill needs, as well as cooperation between stakeholders (including social partners), institutions and VET providers to work in partnerships to match supply and demand.

Improving the individual’s knowledge, skills and competence and increasing the quality and relevance (in terms of responding to the needs of the labour market and society, and reflecting rapidly changing priorities) of VET systems

is therefore the core of European policies. This particularly includes the *New skills agenda for Europe: working together to strengthen human capital, employability and competitiveness* (Council of the European Union, 2016), the Council Recommendation on *Upskilling pathways: new opportunities for adults* (European Commission, 2016) and the recently published *European skills agenda for sustainable competitiveness, social fairness and resilience* (European Commission, 2020a). The *European skills agenda* also takes into account the COVID-19 pandemic that has not only accelerated the digital transition of learning and working but has also significantly impacted the socioeconomic situation and the career opportunities for many people. The disruption to VET (in the context of lockdowns, social distancing and travel restrictions) and the cuts in apprenticeship offers (due to a widely anticipated economic recession) might lead to shortages of skilled workers in the long term, thereby hindering the recovery process (OECD, 2020). The *European skills agenda*, therefore, aims at strengthening sustainable competitiveness, ensuring social fairness and improving the resilience of people and educational systems through skills. It sets ambitious, quantitative objectives for upskilling (improving existing skills) and reskilling (training in new skills) to be achieved within the next 5 years through a set of 12 ‘actions’, including a proposal for a *Council Recommendation on vocational education and training for sustainable competitiveness, social fairness and resilience* that was finally adopted in November 2020 (Council of the European Union, 2020). One of the aims of the VET recommendation is to develop strong, resilient and future-proof VET systems and to ensure that VET is agile, adapting swiftly to future labour market needs. This objective should be achieved, for example, with VET programmes that ‘offer a balanced mix of vocational and technical skills, well aligned to all economic cycles, constantly evolving jobs and working methods and key competences, including solid basic skills, digital, transversal, green and other life skills which provide strong foundations for resilience, lifelong employability, social inclusion, active citizenship and personal development.’ Moreover, ‘VET curricula, programme offers and qualifications are continuously updated using strong skills intelligence (i.e. graduate tracking systems, skills anticipation mechanisms, including at sectoral and regional levels)’ (Council of the European Union, 2020, pp. 5–6). This is further emphasised by the *Pact for skills* (European Commission, 2020b), launched in November 2020, which includes among its principles Monitoring skills supply/demand and anticipating skills needs, and Building strong skills partnerships. With the Osnabrück Declaration (2020), the ministers responsible for VET in

the Member States, the EU Candidate Countries and the EEA countries, the European social partners and the European Commission agreed on a new set of policy actions in VET for 2021-25 to complement and operationalise the vision and strategic objectives formulated in the VET Recommendation. One of its main areas refers to 'Resilience and excellence through quality, inclusive and flexible VET' and calls for the development of 'national and regional skills intelligence systems including skills anticipation and graduate tracking; enable social partners, decision-makers, stakeholders and providers to adapt and update VET programmes, curricula and guidelines in a timely and effective manner'. The VET Recommendation and the Osnabrück Declaration also include reference to the implementation of a strategic approach to international cooperation in VET, to improved opportunities for learning mobility and recognition of learning outcomes, and to user-friendly information on learning and career opportunities within the EU.

Various measures have been, and are being, used to support the achievement of these objectives, including the exchange of information and mutual learning between countries.

1.3. Key objectives, main research questions and methodological approach

The key objective of this report is to take stock of the research done in the different parts of the overall project and to bring together the different findings related to the methods and instruments explored. It builds on the lessons learned during the previous research phases but, since this project was not carried out in isolation, it also reflects on important developments and new policy discussions and refers to other relevant methodological approaches (particularly those relevant for the updating and renewal of qualifications).

The analysis and comparison of qualifications should not serve as an end in itself or merely satisfy research interests; it is intended in a broader sense as an approach to support the review and renewal of national qualifications and to support the transferability of learning outcomes and flexible learning pathways. This report, therefore, explores, at a conceptual level, potential use cases or applications of the methodologies explored. It discusses for what purposes, for whom and by whom these methodologies could be used to contribute to the achievement of different objectives, which methods and instruments are already available, which need to be adapted and which

conditions need to be met for their potential application. The added value of applying these methods in specific contexts is also discussed. However, the use cases do not offer ready-made solutions for specific problems and needs: this synthesis report is oriented towards providing technical support and discussing options for possible future solution steps to support policy processes with regard to specific needs.

The key research questions are presented in Box 1.

Box 1. Key research questions for WA4

1. How can methodologies for analysing and comparing qualifications support European cooperation in VET and support national stakeholders in strengthening quality and relevance of VET qualifications?
2. Which purposes, target groups and stakeholders for analysing and comparing qualifications in this context can be identified (use cases)?
3. What is needed in terms of methodologies and necessary conditions to implement the use cases?

Source: Cedefop.

The research activities of the overall project included 10 countries (Austria, Bulgaria, Denmark, Finland, France, Ireland, Lithuania, the Netherlands, Spain, and United Kingdom-England) and focused on two qualification profiles:

- (a) healthcare assistant: healthcare assistants (assistant nurses, practical nurses) provide assistance, support and direct personal care to patients and residents in a variety of institutional settings such as hospitals, clinics, nursing homes and care facilities for the aged. They generally work in support or under the guidance of qualified healthcare professionals (often nurses) or associate professionals;
- (b) ICT service technician: these provide ICT support and systems service in companies/institutions; the focus is on more technical aspects of ICT installation, service and maintenance.

For this final work assignment, as a first step, the findings and lessons learned from the previous research phases were summarised and relevant recent policy initiatives and activities (mainly of DG EMPL and Cedefop) were explored and linked to these developments, where appropriate.

Next, potential use cases for the methodologies explored were identified and described (using material developed in the project to illustrate methodologies) to inspire further developments.

In order to broaden the feedback on the applicability of the methodological elements (and their potential combinations) for systematically analysing and comparing qualifications for different purposes, as well as on the potential use cases, an online workshop with country experts was organised. The workshop discussed:

- (a) the purposes for analysing and comparing qualifications (focusing on intended learning outcomes) and the methodological approaches identified;
- (b) the feasibility of applying the methodologies, as illustrated in the potential use cases, in their national contexts.

Based on these discussions and reflections, the report was further fine-tuned, possible caveats were identified, and recommendations developed on how the methodological elements can be further developed to strengthen quality and relevance of VET qualifications.

1.4. Overview of this report

Chapter 2 reflects on findings and lessons learned from the previous research phases, related to reference points for analysing and comparing VET qualifications, data sources for national VET qualifications and their learning outcomes, the use of digital technologies to support analysis and comparison of VET qualifications and methodologies for closing the feedback loop between VET and the labour market (with a particular focus on employer reflection surveys). It also takes stock of relevant recent developments and activities to be considered, particularly in the context of ESCO.

Chapter 3 reflects on the purposes and stakeholders involved in using methodologies for analysing and comparing the content of VET qualifications, and discusses selected potential use cases related to three broad purposes: supporting quality, relevance and excellence of VET qualifications; supporting the transferability of learning outcomes and flexible learning pathways in the national and international context; and supporting the development of European vocational core profiles.

Chapter 4 presents conclusions and recommendations.

CHAPTER 2

Methodological developments: taking stock

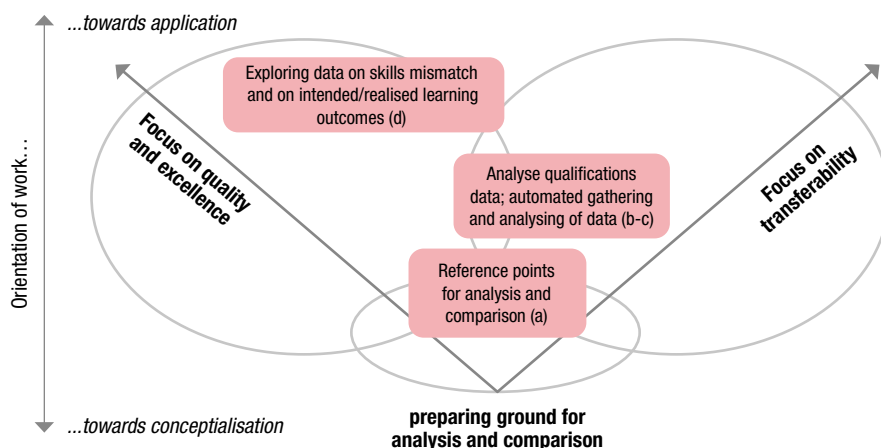
2.1. Introduction

This study has a strong focus on the supply side of education and training, on the provision of knowledge, skills and competences, while many other research activities (including those conducted by Cedefop) have a stronger focus on the demand side.

The analysis and comparison of qualifications can contribute to quality improvement in VET and the pursuit of excellence, and to more transparency of qualifications from different countries, facilitating transferability of qualifications and mobility. These two orientations form the basis for situating the reflections on:

- (a) reference points for analysing and comparing VET qualifications;
- (b) data sources for national VET qualifications and their learning outcomes;
- (c) the use of digital technologies to support comparison of VET qualifications;
- (d) methodologies for completing the feedback loop between VET and the labour market (with a particular focus on employer reflection surveys).

The following figure situates these methodological reflections in relation to the above orientations for the analysis and comparison of VET qualifications. It also points to the focus of the methodological reflections, on the conceptualisation or application of analysis and comparison, as some reflections are more related to conceptual considerations, while others are directly focused on improving the quality of national VET qualifications and supporting transferability of learning outcomes and mobility.

Figure 2. **Analytical framework**

Source: Cedefop.

This chapter considers relevant recent developments and activities (mainly by DG EMPL and Cedefop) related to the aspects addressed.

2.2. Reference points for analysing and comparing VET qualifications content

2.2.1. Reference points and systems: introduction

In the context of this study, a reference point is understood as conceptual fixed point for mapping learning outcomes included in national qualifications in order to analyse and compare them and identify commonalities and differences in their content and profile. A reference point itself does not necessarily have to use learning outcomes, but descriptors to which learning outcomes contained in qualifications can be mapped. Different objectives and use contexts require different levels of abstraction of reference points. Examples of such reference points or systems include:

- (a) world reference levels (WRL);
- (b) European qualifications framework (EQF) and other regional qualifications frameworks;
- (c) national qualifications frameworks (NQF);
- (d) sectoral qualifications frameworks;

- (e) competence frameworks (such as e-competence framework, competence framework for languages);
- (f) occupational skills profiles (OSP).

Only the last three are usually at a level of detail that allows for mapping of learning outcomes and comparing the content of individual qualifications. Qualifications frameworks can be used for comparing the levels of qualifications but usually do not go deeper and the WRL only provide a rather broad picture (see description in Box 2). Competence frameworks are more detailed but typically focus on a specific competence area and are therefore of limited use for comparing more comprehensive VET qualifications.

Box 2. World reference levels

UNESCO's work on WRLs was undertaken in response to a recommendation of the Third International Congress on TVET in Shanghai in 2012, as a result of which UNESCO was called upon 'to identify a set of world reference levels, to facilitate the international comparison and recognition of TVET qualifications'. The result of this work is a WRL tool in two forms: a **digital levelling instrument** and a back-up paper-based instrument.

WRL are based on 11 elements of capability and eight stages of progression. The stages are identified as A1 and A2, B1 and B2, C1 and C2, and D1 and D2. The WRL tool is used to create a graphic profile that translates any set of outcomes into WRL terms, and a more detailed report for any qualification or credential that has been awarded on the basis of quality-assured assessment. The WRL digital tool takes the form of a survey in which the user selects the most appropriate terms from lists provided.

WRL profiles are designed to give a broad picture of what individuals will be able to do in a wide range of academic, occupation and social situations. They can be created for full qualifications, part qualifications, credentials, level descriptors, entry requirements for courses of learning, occupational standards, and job specifications. The main purpose of the WRLs should be to assist actors across the world to make comparisons of the outcomes of lifelong learning and reach agreements on the recognition of qualifications and credentials. The WRL tool itself should not act as a qualifications framework.

The WRL tool has been piloted throughout 2019. An example of a WRL profile is displayed below.

Technical skills credential (awarded by Xxxxx)								
Stage element	A1	A2	B1	B2	C1	C2	D1	D2
1. Activities	[Red bar]							
2. Responsibilities	[Blue bar]							
3. Working with others	not fully relevant							
4. Quality	not fully relevant							
5. Skills & procedures	[Grey bar]							
6. Communication	[Blue bar]							
7. Data	[Yellow bar]							
7. Knowledge & know-how	[Pink bar]							
9. Context	[Grey bar]							
10. Problems	[Orange bar]							
11. Values	not fully relevant							

Sources: Hart, J.; Chakroun, B. (2019); UNESCO (2019); <https://worldreferencelevels.org/overview/>.

Reference points and systems taking the form of OSP were used and tested in this study. OSP are profiles that describe the requirements or essential characteristics of occupations in terms of knowledge, skills, competences, professional interests and work values. They can be independent profiles, e.g. referring only to a specific occupational profile, or they can be part of a more complex 'reference system'. A 'reference system' is a systematic approach to developing and maintaining OSP for different economic sectors and occupational fields. It defines how OSP are developed and provides some kind of structuring of OSP content. They can be developed at national and international level. Reference systems can also include other aspects, such as showing relationships between OSP. In this study, we examine the possibility of a broader scope of use and therefore reference systems (which include reference points, i.e. OSP), are more interesting. However, since individual reference points (not specifically linked to a reference system) also have the potential to form the basis for the development of a reference system, they are not categorically excluded.

2.2.2. The use of reference point or systems in the different strands of the study

The aim of the first part of the study was to test appropriate reference points and systems for the cross-country comparison of the content and profile of qualifications. It explored the relative strengths and weaknesses of the following reference points:

- (a) **ESCO** (v1), the multilingual classification of European skills, competences, qualifications and occupations;
- (b) Occupational information network (**O*NET**), the USA's primary source of vocational intelligence;
- (c) WorldSkills standards specifications (**WSSS**), which are used as the reference points for the WorldSkills competition;
- (d) the **VQTS** (Vocational qualification transfer system) model, which was developed and further applied in a series of EU funded projects developing VQTS-based competence matrices (1).

The learning outcomes of national qualifications (healthcare assistant and ICT service technician) from 10 countries (Austria, Bulgaria, Denmark, Finland, France, Ireland, Lithuania, the Netherlands, Spain, and United Kingdom-England) were used to test the selected reference points:

Table 1. Reference points used for testing in WA1

Reference point	Healthcare assistant	ICT service technician
ESCO (v1) occupational profile	Healthcare assistant	ICT technician
O*NET	Nursing assistants	Network and computer systems administrators
WSSS (2)	Health and Social Care (WSSS41)	IT Network Systems Administrator (WSSS39)
VQTS	VQTS-based Competence Matrix 'Professional Care' developed in the EU project HCEU	

Source: Cedefop.

(1) Luomi-Messerer (2009).

(2) In this study, the versions available in September 2018 were used.

In the second part of this study, the ESCO skills pillar (v103) was used to explore to what extent, and how, digital tools can support the analysis and comparison of VET qualifications. For the texting exercise, the Dutch qualification of ICT service technician (core tasks/work processes) was selected.

In the third part of this study (Cedefop, 2021), a reference point, partly building on the ESCO occupational profiles for healthcare assistant and ICT service technician, was specifically designed for pre-testing an employer reflection survey in Lithuania and the Netherlands related to the two profiles.

2.2.3. Lessons learned

In the first part of the study, country researchers, supported by sector experts, conducted the mapping and reflected on strengths and weaknesses of each reference point. The approach taken for the mapping exercise is presented in the Box 3.

Box 3. Mapping exercise

The KSC concepts included in each reference point are listed in an Excel file, complemented by more detailed descriptions, if available. For each term listed, it can then be assessed whether it is 'explicitly', 'implicitly' or 'not at all' covered in the national qualification description. It is recommended to include the exact wording of the learning outcomes in question (in national language and in English) and possibly also complementary information on whether the learning outcomes were optional or mandatory. Learning outcomes included in the national qualifications but not in the reference point can also be documented. Ideally, this mapping is carried out by an expert for the respective qualification or at least validated by an expert.

The mapping needs to be done for all qualifications to be compared and the results can then be merged into one Excel database, to allow for comparison of the qualifications as well as for an assessment of the reference point itself.

The reference point can be assessed related to its comprehensiveness and its relevance: an indication of how well a reference point is able to reflect the learning outcomes of a national qualification is whether all learning outcomes of the qualification are represented in the reference point ('reference point is comprehensive'). A second aspect is whether the reference point does not exceed too much the learning outcomes of national qualifications ('reference point is relevant'). Ideally, the reference point is sufficiently comprehensive and relevant for the VET qualifications mapped to it. If this is not the case for the majority of the qualifications, it should be considered whether another reference point (such as another ESCO occupational profile) might fit better.

Source: Cedefop.

The mapping exercise revealed that all four analysed reference points show potential to be generally applicable as reference points for analysing and comparing VET qualifications. They provide opportunities in different contexts in which comparison of VET qualifications is involved and their use could be further explored ⁽³⁾. They all show strengths and weaknesses when used in this context. A common weakness is that they are all only partly able to capture the scope of the national qualifications and they all

⁽³⁾ Particularly the use of VQTS-based competence matrices, which is strongly linked to work tasks and activities, or WSSS can be further explored in cross-country cooperation activities within Europe, possibly at a sectoral level (such as in Erasmus+ projects, sector skills alliances, centres of vocational excellence).

face challenges in terms of comprehensiveness and relevance in relation to different country contexts. The comparison of qualifications with each other based on the reference points is, therefore, only of limited informative value, as there are learning outcomes in some national qualifications that are not reflected in the reference points.

An ideal reference point for analysing and comparing VET qualifications should support the weighting of knowledge, skills and competences (KSC) within the overall profile. It should indicate the importance of specific learning outcomes by at least distinguishing, for example, between 'core' and 'supplemental', or between 'essential' and 'optional'. Such a distinction should be drawn in a concise, systematic manner, based on empirical evidence, and could be further specified by a numerical indication ranking KSC within the overall profile. However, none of the reference points tested provide sufficient ground to apply weighting approaches in the sense of providing an insight into what are considered to be essential and less essential learning outcomes. Some reference points, such as ESCO occupational profiles, make such a distinction: ESCO profiles clearly distinguish between 'essential' and 'optional' demands for 'skills/competences' and 'knowledge', and thus indicating the varying degrees of importance of individual or groups of learning outcomes included ⁽⁴⁾. However, it is generally unclear what the weighting of different learning outcomes in national qualification descriptions should be based on. National qualifications also tend to use other ways of grouping learning outcomes that do not match those in the reference points. Therefore, even if qualifications distinguish between essential and optional units, an indication of the weighting of the individual learning outcomes included in the units is not easily 'translatable' in the mapping process.

When analysing and comparing learning outcomes descriptions of VET qualifications, it is not sufficient to look only at the KSC a learner should have acquired at the end of education and training, but also at the required level of performance. Performance levels or levels of mastery refer to the 'vertical' dimension of learning outcomes. Sometimes specific systems, concepts or taxonomies are used for indicating the performance level of

(⁴) Also O*NET uses 'importance' (e.g. of certain tasks, knowledge, skills, abilities, work activities), 'frequency' (e.g. of tasks), 'extent' (e.g. of work values), specific rating scale for work context (e.g. 'every day', 'never', etc.) and in WSSS, percentages are indicated per section, showing the relative importance of a group of skills within the respective 'skill'. However, the weighting approaches used in O*NET and WSSS were not visualised in the reference points tested in this project in order to reduce complexity.

learning outcomes. The one most often used is Bloom's taxonomy, others include the Dreyfus and the SOLO taxonomies (Cedefop, 2017, pp. 33-36). However, another weakness of most of the reference points explored is that they do not reflect the performance level of learning outcomes ⁽⁵⁾.

It is important to note that the same learning outcomes statement does not necessarily have the same meaning in different VET or labour market contexts. They are open for different interpretations as a term has a meaning in a specific context and it might have another meaning in another context. It was also noted that the sole focus on learning outcomes imposes a certain restriction for the international comparison of qualifications. VET qualifications are more than just a list of learning outcomes and are embedded in the respective national context. They have a signalling function based on their value for the labour market, further learning and society in general, and might be linked to specific rights, entitlements or status. This cannot be expressed by mapping the learning outcomes of qualifications to reference points composed of skills concepts and is therefore not considered in the comparison of qualifications based on this mapping exercise.

Nevertheless, a reference point (based on learning outcomes or on concepts that can be related to learning outcomes) can support the reflection on the content of VET qualifications (particularly if learning outcomes are articulated at the level of qualifications and not only at sublevels, such as modules) and can serve at least to some extent as translation hub between VET qualifications (usually as a starting point for further analysis) as well as between the supply and the demand sides, in different usage contexts.

Based on the analysis and testing of existing options, ESCO was identified as currently best positioned for the purpose of analysing and comparing VET qualifications in terms of sectoral and linguistic coverage ⁽⁶⁾ and also because a distinction between transversal and occupation-specific knowledge, skills and competences is applied. ESCO also appeared to be the most relevant reference system (compared to the other three) for other usage contexts, including the automated collection/analysis of national qualifications data,

⁽⁵⁾ Of the four models analysed, the VTQS/HCEU reference point is the only one that addresses the issue of competence levels of vocational learning outcomes (complexity levels or performance levels) in a logical and consistent way by distinguishing levels of competence development. The world reference levels, with eight stages of progression, can also be mentioned here as an exception; however, they only provide information on qualifications at a more general level and were not included in the analysis in this study.

⁽⁶⁾ ESCO is now available in 27 languages (all official EU languages plus Arabic, Icelandic and Norwegian).

the data collection/survey on (mis)match between qualifications and labour market requirements, for structuring online information systems on labour market and VET related topics (e.g. the [EU Skills Panorama](#)), and the (automated) collection and analysis of national vacancy data (e.g. [Cedefop's project on real-time labour market information](#), RTLMI, or the [European skills & jobs survey](#)). Again, this is due to the far greater coverage of ESCO in terms of sectors and languages and the reference to labour markets in EU countries. ESCO is strongly promoted by the European Commission and it can therefore be expected that it will continuously be maintained and conceptually improved.

However, it needs to be pointed out that some usage contexts required an adaptation of the ESCO occupational profiles. This was the case in the first part of the study where some changes were made to the ESCO occupational profiles in order to support the mapping process. The main purpose of the amendments was to keep in check the overall length of the reference points (so that an individual list would consist of no more than 125 terms) and to group the occupational knowledge, skills and competences in order to provide a better overview. Therefore, some overly granular terms were replaced with their broader/superordinate ones and the knowledge, skills and competences were structured and grouped according to the WSSS (WorldSkills standards specification) sections. In the list of transversal knowledge, skills and competences, adaptations concerned the group of digital competences. While with all other groups narrower terms were used when available, digital competences were reduced to their five broader terms.

The first part of the study used ESCO occupational profiles and the second part used the whole reference system, the ESCO skills pillar (v103). For the third part of the study, the ESCO occupational profiles for healthcare assistant and ICT service technician had to be adapted by reducing the skills concepts included to ensure usability in the specific context, the employer reflection survey. Inspired by existing national approaches, the research team developed a reference point that included a list of generic skills (around 75% of the skills) and a list of qualification profile-specific skills (around 25%). The latter is based on the respective ESCO occupational profiles but only including those skills that were identified in the mapping exercise of the first part of this study as 'core skills', since they are included in at least eight of

the 10 national VET qualifications analysed (7). For the purpose of the study, which included a reflection on the skills obtained by the VET provider, the graduate and the employer, it was essential to develop a reference point allowing for reasonable skills assessments, striking a balance between occupation-specific and generic skills, while keeping the total number of skills at a manageable level that allows their application in employer and graduate surveys. It seemed important to develop a reference point based on existing trusted skills sets (in order not to undermine the use of the tool), thereby avoiding both oversimplification (with the risk of being potentially meaningless) and over-complexity (with the risk of not being understood by graduates and employers); a balance needs to be achieved related to the level of detail of the skills set included in the reference point.

While ESCO was used in all parts of the study, several areas were identified where ESCO needs to be further developed in order to make better use of it: for example, ESCO could introduce levels of proficiency into its occupational skills profiles to be better able to differentiate between qualifications at different levels. In particular, it was found that the conceptual foundation of ESCO would need to be improved to ensure consistency in the description of knowledge, skills and competences (vocabulary control) and that it can be used to cluster, classify and organise knowledge, skills and competences for designing occupational skills profiles. The improved conceptual foundation should also ensure better embedding of the transversal and occupational learning outcomes in a systematic manner. It was suggested that, besides other sources, inspiration for further development could be taken from WSSS (clustering learning outcomes), O*NET (conceptual model) and the VQTS model (both regarding embedding transversal and occupational learning outcomes, and regarding levels of proficiency).

The exploration of the use of digital tools in the mapping exercise also concluded that the ESCO skills concepts should be better aligned with the language found in qualification descriptions or vacancies, e.g. including these as synonyms. This could transform ESCO into a valuable lexical resource for (further) attempts to (automatically) compare qualifications. This includes:

(7) It should be mentioned that the notion of 'core skills' might not be entirely correct: it just shows the skills set that is common in VET qualifications of least 8 of the 10 countries. However, it does not reflect on the importance of these common skills within each national qualification and it could be the case that knowledge, skills and competences, which are of high importance in a national qualification, do not appear in this common set of skills at all.

- (a) enriching the vocabulary, with stemmed versions of skills phrases via generating skills phrases from existing texts (e.g. vacancies or qualifications) or via incorporating suitable resources from existing projects that process such texts ⁽⁹⁾;
- (b) supplementing semantic structure to enable aggregations;
- (c) dissecting complex skills into enabling skills components to make implicit components visible and to gain insight into performance levels;
- (d) consolidating terminology (e.g. summarising skills expressing the same meaning with different words under one concept).

The set of skills that was used in the third part of the study for the employer reflection survey applied a similar structure for categorising transversal skills and competences as suggested in the further development of ESCO (for more information see Section 2.2.4.3): it applied an internal structure that is moving from skills related to the 'self' to skills related to a 'wider context'. This seems to be an appropriate approach that is understandable for employers and graduates, as the feedback from respondents shows. The distinction between transversal and occupation-specific skills and competences, however, still needs further consideration. ESCO distinguishes knowledge, skills and competences (KSC) concepts based on their 'skill reusability level', indicating how widely a concept can be applied:

- (a) transversal KSC (broad range of occupations and sectors, such as work in teams);
- (b) cross-sectoral KSC (relevant to occupations across several economic sectors);
- (c) sector-specific KSC (specific to one sector, but relevant for more than one occupation within that sector);
- (d) occupation-specific KSC (usually applied only within one occupation and its specialisms).

The first part of this study pointed to some shortcomings of ESCO related to the separation of transversal and occupation specific skills. For example, the distinction between occupational and transversal KSC was considered as unclear and the list of transversal KSC as too detailed; in some cases an overlap was observed, since transversal KSC were also included as occupation

⁽⁹⁾ Textkernel, for example, generates skills phrases from millions of vacancies, thus creating a vocabulary bottom-up. Unfortunately, this vocabulary cannot be structured by machines alone, and it would require human intelligence to connect terms.

specific KSC. This separation was also not sufficiently useful for the employer reflection survey: the aim was to use a limited skills list that can be applied in different occupations and qualifications to allow comparison between them. A solution was to introduce the concept of ‘general occupation-related skills and competences’ which are transversal in the sense that they transcend specific skills (see Winch, 2015, p. 170), meaning that they mean something differently in different occupational contexts. It also means that these skills are not necessarily transferable between contexts. For ESCO, it could be relevant to explore further this tension between generic and job-specific competences and between transversal and transferable competences.

The final reports for the first and second parts of the study were completed in spring and in December 2019, respectively, and the research for the third part was carried out 2019/20. The assessment of the use of ESCO as reference system for the different purposes refers to the versions of the skills thesaurus available at that time. During recent months, ESCO has been further developed and some of the shortcomings referred to above have already been addressed. The following sections will therefore take stock of these developments.

2.2.4. Taking stock of developments within ESCO

2.2.4.1. Introduction

ESCO describes the occupations and knowledge, skills and competences of all sectors and levels relevant for ‘build[ing] an integrated labour market across Europe’ and for bridging ‘the communication gap between the world of work and the world of education and training’ (European Commission, 2017, p. 5). The ESCO (v1) skills pillar distinguishes between two different types of concepts (called ‘skill type’): skill/competence concepts and knowledge concepts. Both of these types of concepts may also be defined in the skills pillar as ‘transversal’. Transversal knowledge, skills and competences are said to be relevant to a broad range of occupations and economic sectors (such as work in teams) and as the cornerstone for the personal development of an individual.

The ESCO (v1) skills pillar has a thesaurus structure, in the sense that concepts are expressed by a unique preferred term, and supplemented by non-preferred and hidden terms. A fully developed hierarchical structure summarising skills of related content systematically under broader skills groups was developed only for the relatively small subset of transversal

knowledge, skills and competences. The other items in the skills pillar, the ‘occupational’ knowledge, skills and competences, are not grouped into a general hierarchy ⁽⁹⁾ although they have all been assigned a skill reusability level of either cross-sectoral knowledge, skills and competences (relevant to occupations across several economic sectors), sector-specific (specific to one sector, but relevant for more than one occupation within that sector), or occupation-specific (usually applied only within one occupation and its specialisms) ⁽¹⁰⁾.

The European Commission is continuously working to improve ESCO (launched in July 2017) and supports its users. In recent months, the ESCO skills pillar has been further developed: in May 2020, the Commission released an improved version, ESCO v1.0.5 ⁽¹¹⁾. This version introduced a skills hierarchy, a classification of all 13 485 skills concepts under broader concepts. Consideration has also been given to a further development of transversal skills; however, a revised version of transversal skills will not be shared with the public before the release of ESCO v 1.1 (published end 2021).

Since a classified presentation of ESCO skills is also reflected in occupational profiles, it is interesting to compare these new profiles of healthcare assistant and ICT technician with their previous versions, and to investigate how these changes potentially affect the mapping process and ESCO’s evaluation as a reference point for comparing qualifications. In the following sections, recent and continuing developments and improvements of the ESCO skills pillar are presented, before the mapping results are analysed on the basis of the revised reference points.

It is important to be aware that ESCO developments are in progress (some might say that ESCO is a moving target) and it is therefore not possible to take into account all changes within the current project. Therefore, the revised reference points and the results of the mapping discussed below reflect the status quo of the ESCO revisions in April (occupational skills) and November 2020 (transversal skills).

⁽⁹⁾ There is one exception: occupation- or sector-specific skills which were interpreted as a contextualisation of transversal skills by the ESCO team have been subordinated to transversal skills.

⁽¹⁰⁾ See more on [ESCOPedia – Skill reusability level](#).

⁽¹¹⁾ The current version is ESCO v1.0.8, published in August 2020 (with minor revisions compared to v1.0.5).

2.2.4.2. Occupational skills

In 2019, an expert working group was established for introducing a skills hierarchy (to allow for a more easy and intuitive access to ESCO skills and knowledge concepts) and for defining principles which will form the basis for mapping the ESCO skill concepts to this new hierarchy. This new ESCO skills and knowledge classification was developed as a single hierarchical framework containing four distinct sub-classifications, structured according to different principles and targeting different KSC concepts. Within each of these four broad sections the concepts are structured in a three-level hierarchy based on characteristics customised for each sub-classification. These sub-classifications include:

- (a) K – Knowledge: knowledge concepts are grouped according to ISCED-Fs 80 detailed fields of education ⁽¹²⁾;
- (b) S – Skills/competences: these concepts are grouped by a separate three-level structure, influenced by a Canadian classification (the **Canadian skills and knowledge glossary**) and O*NET's intermediate work activities (IWAs) ⁽¹³⁾. The categories of the skills classification were designed to be as homogenous as possible in relation to one of the following characteristics:
 - (i) tools and equipment used;
 - (ii) the type of object on which the work is performed;
 - (iii) the function or outcome of the task or activity.

The nature of the associated interpersonal interaction was also taken into account. The expert group finally suggested eight categories for structuring and classifying skills concepts ⁽¹⁴⁾.

- (i) S1: communication, collaboration and creativity;
- (ii) S2: information skills;
- (iii) S3: assisting and caring;
- (iv) S4: management skills;
- (v) S5: working with computers;
- (vi) S6: handling and moving;
- (vii) S7: constructing;

⁽¹²⁾ **International standard classification of education** (ISCED): fields of education and training (ISCED-F 2013)

⁽¹³⁾ O*NET is the Occupational information network of the U.S. Department of Labor. Every **IWA** is linked to exactly one work activity from the O*NET Content Model.

⁽¹⁴⁾ Originally there was an organisation leading from the internal to the external, but this was only consistently applied for the top-level of the classification. This issue needs to be addressed at a later stage.

- (viii) S8: working with machinery and specialised equipment.
- (c) A – Attitudes and values: the current ESCO (v1) structure is retained;
- (d) L – Language skills and knowledge: the current ESCO (v1) structure is also retained here (aligned with the **Common European framework of reference for languages – CEFRL**).

The ESCO skills concepts were assigned to the most detailed level of the hierarchy, but the skills concepts themselves remained untouched, even if shortcomings were found when assigning them to the new classification. The classification and its application will need to be adapted to address feedback currently collected from implementors (such as EURES, Europass, Skills OVATE) and potential users (such as national public employment services which will find it easier to map their national skills taxonomies to a classified version of ESCO skills) ⁽¹⁵⁾.

This new skills classification does not only allow for a structured presentation of occupational profiles; it also supplements an additional generalisation level for ESCO skills concepts, which are often very detailed. It provides a template or frame of reference for creating or revising occupational skills profiles, with the eight-category structure of skills, in particular, offering a more accessible reference point for mapping and comparing qualifications.

2.2.4.3. *Transversal skills*

Transversal skills and competences in ESCO (v1) are structured along the following classificatory categories:

- (a) application of knowledge;
- (b) attitudes and values;
- (c) social interaction;
- (d) thinking.

These four main categories are organised as hierarchies, ranging from general to specific. Although considerable effort has been invested in the development of the transversal KSC in ESCO, experience with the use of this

⁽¹⁵⁾ **EURES** is a cooperation network designed to facilitate the free movement of workers within the EU-27 countries plus Iceland, Liechtenstein, Norway, Switzerland and the United Kingdom. **Europass** consists of documents and tools designed to help European citizens make their skills and qualifications in Europe clear and easy to understand. **Skills OVATE** is the online vacancy analysis tool for Europe.

terminology has revealed some shortcomings that need improvement ⁽¹⁶⁾. The joint meeting of the EQF Advisory Group and the ESCO Member State working group (February 2019) also acknowledged the need for agreed terminology on transversal skills and competences. Consistent terminology was considered suitable to serve as a reference point and resource for a variety of applications dealing with the needs of education, training and work.

A separate expert working group was set up to develop further the terminology on transversal skills and competences currently forming part of ESCO (v1). Deliverables from this work include a proposed definition of the term 'transversal skills and competences' and a proposed structuring of such skills and competences through the identification of main terminological categories and clusters. A proposal for structuring transversal skills and competences (TSC) in ESCO was finalised in September 2020 and is currently being discussed.

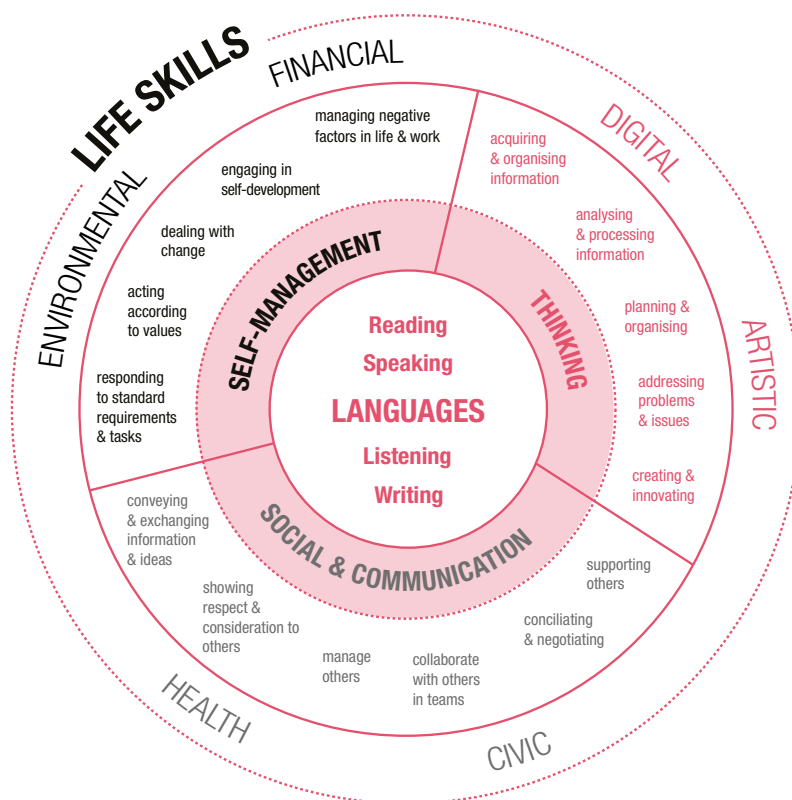
The current proposal recommends the use of five categories for structuring TSC in ESCO:

- (a) language skills and competences;
- (b) thinking (cognitive) skills and competences;
- (c) self-management skills and competences;
- (d) social and communication skills and competences;
- (e) life skills and competences.

These five categories are arranged 'from internal to external', or from more dispositional categories, depending on a clear internal perspective, to more situational categories, requiring clear external perspectives. This was also considered a useful approach in the employer reflection survey and is shown in Figure 3.

⁽¹⁶⁾ See *The need for an agreed terminology on transversal skills and competences – Note AG 49-4/ JAG 2-4* prepared for the meetings of the EQF Advisory Group and ESCO Member States working group, 5 to 7 February 2019.

Figure 3. Transversal skills and competences in ESCO



Source: Noack, 2020.

Unlike the restructuring of the ESCO occupational skills, the restructuring of the transversal skills is currently still at draft stage, and has not been directly implemented in the ESCO classification. As a result, for the revisited mapping exercise, the ESCO occupational profiles have been separated from the ESCO transversal skills, and the mapping carried out separately.

2.2.4.4. Mapping exercise revisited (occupational KSC)

As a first step, the two ESCO occupational profiles for healthcare assistant and ICT technician were prepared with the new structure for occupational KSC. These more concise profiles were then used for post-coding the data

collected for the two profiles in the 10 countries in the first part of this project. The results of the comparison, as well as the differences between them and the results of the comparison conducted in the first part of the project, are discussed in this section.

For the mapping carried out in the first part of this project, ESCO profiles consisted of both occupational KSCs and the list of transversal KSCs. For this revisited mapping exercise, the transversal KSCs had to be separated from the occupational KSC, to account for the fact that, so far, only the revised structuring of occupational KSC has already been implemented in ESCO.

Healthcare assistant

With the restructuring of ESCO occupational profiles, the KSC concepts themselves remained untouched. The same applies to the number of occupational KSC items included. Thus, the restructuring of ESCO profiles does not have an impact on the comprehensiveness and relevance of the reference point.

Average coverage remains at 75%, while median coverage remains at 76%, with coverage corresponding to the share of KSC terms that are either implicitly or explicitly covered in the national qualification. Table 2 summarises this information.

Table 2. Mapping table for healthcare assistant

			BG
		EQF level	4
Category	KSC_RelationType	Volume of additional LO KSC	high
Knowledge	Optional	geriatrics	
	Optional	sterilization techniques	
	Optional	older adults' needs	
	Optional	disability types	
	Optional	disability care	
Attitudes	Essential	respond to changing situations in health care	
	Essential	comply with quality standards related to healthcare practice	
Values	Essential	promote inclusion	
	Essential	work in a multicultural environment in health care	
	Essential	empathise with the healthcare user	
Communication, collaboration and creativity	Essential	communicate with nursing staff	
	Essential	develop a collaborative therapeutic relationship	
	Essential	educate on the prevention of illness	
	Essential	provide health education	
	Essential	inform policy makers on health-related challenges	
	Essential	advise on healthcare users' informed consent	
	Essential	convey medical routine information	
	Essential	interact with healthcare users	
	Essential	listen actively	
	Essential	work in multidisciplinary health teams	
	Essential	work with nursing staff	
	Essential	accept own accountability	
	Essential	work under supervision in care	
	Essential	support nurses	
	Optional	communicate in foreign languages with health service providers	

			BG
		EQF level	4
Category	KSC_RelationType	Volume of additional LO KSC	high
Communication, collaboration and creativity	Optional	employ foreign languages for health-related research	
	Optional	employ foreign languages in care	
Information skills	Essential	manage healthcare users' data	
	Essential	identify abnormalities	
	Essential	monitor basic patients signs	
Assisting and caring	Optional	support individuals to adjust to physical disability	
	Essential	use e-health and mobile health technologies	
	Essential	contribute to continuity of health care	
	Essential	apply health sciences	
	Optional	assist in the administration of medication to elderly	
	Essential	ensure safety of healthcare users	
	Essential	comply with legislation related to health care	
	Essential	follow clinical guidelines	
	Essential	adhere to organisational guidelines	
	Essential	deal with emergency care situations	
	Optional	distribute meals to patients	
	Essential	provide basic support to patients	
	Management skills	Essential	apply organisational techniques
Optional		evaluate older adults' ability to take care of themselves	
Working with computers	Essential	have computer literacy	
Handling and moving	Optional	conduct cleaning tasks	

Source: Cedefop. List of transversal KSC excluded from the ESCO occupational profile.

Table 3 shows the profile that emerges when selecting those learning outcomes from the ESCO occupational profile that are covered (either explicitly or implicitly) in at least nine out of the 10 qualifications. This set of KSC items can thus be considered as a ‘set of core learning outcomes’ (or ‘common/core profile’) across the 10 qualifications covered. However, this needs to be treated with caution, since it does not provide any indication of the importance of the learning outcomes included in this common profile in the national qualifications. It could even be the case that learning outcomes that are very relevant for a national qualification are not included in this ‘core profile’. Their relevance (in terms of essential or optional items) can only be assessed related to the ESCO occupational profile: for the healthcare assistant, 16 out of 20 items in this profile are ‘essential’ (as opposed to optional) skills and competences. While the list of occupational KSC included in this ‘core profile’ is the same as the one in the first part of the study, the new conceptual structure clearly provides an improved illustration.

Table 3. **Core learning outcomes from the mapping against the healthcare assistant profile**

ESCO – new structure		
Level 1 title	Level 3 title	KSC Label
Attitudes	Apply quality standards	comply with quality standards related to healthcare practice
Values	Demonstrate consideration	empathise with the healthcare user
Communication, collaboration and creativity	Coordinating activities with others	communicate with nursing staff
	Providing medical advice	interact with healthcare users
	Listening and asking questions	listen actively
	Working in teams	work in multidisciplinary health teams
		work with nursing staff
	Following instructions and procedures	work under supervision in care
Assisting and supporting colleagues	support nurses	

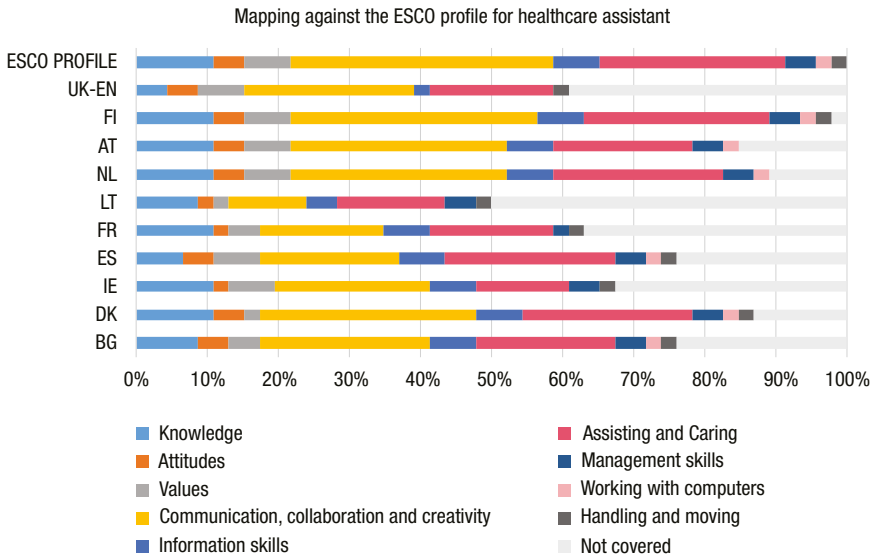
ESCO – new structure		
Level 1 title	Level 3 title	KSC Label
Information skills	Monitoring health conditions	identify abnormalities
		monitor patient basic signs
Assisting and caring	Providing support to resolve problems	support individuals adjusting to physical disability (optional skill/competence)
	Complying with health and safety procedures	ensure safety of healthcare users
		comply with legislation related to health care
	Complying with legal and organisational guidelines	adhere to organisational guidelines
	Assisting with personal needs	provide basic support to patients
Management skills	Planning and scheduling events and activities	apply organisational techniques
Knowledge	Medical diagnostic and treatment technology	sterilisation techniques (optional knowledge)
	Care of the elderly and of disabled adults	disability types (optional knowledge)
		disability care (optional knowledge)

Source: Cedefop. List of transversal KSC excluded from the ESCO occupational profile.

Figure 4 provides a visualisation of the mapping against the ESCO occupational profile and also highlights the key benefit of the new structure for this particular exercise, in that it allows to present the outcomes of the mapping exercise in a generalised and comparable manner. However, the use of bar charts to illustrate the outcomes of the mapping has a considerable drawback in that it suggests an (undesirable) benchmarking aspect. It is important to reiterate that the resulting country profiles are the outcome of the mapping against the ESCO occupational profile. The country profile as such does not provide any information on the scope and breadth of the underlying qualification.

The visualisation for the healthcare assistant using bar charts illustrates the focus on KSC related to communication, collaboration and creativity, as well as assisting and caring. Using the same illustration, the bar chart for the ICT technician confirms the focus on KSC related to working with computers (Figure 4).

Figure 4. **Mapping against the ESCO occupational profile for healthcare assistant**



Source: Cedefop. List of transversal KSC excluded from the ESCO occupational profile.

ICT Technician

Some amendments were made to ESCO occupational profiles in the first part of the project, in order to keep the size of the overall reference point (then also including transversal KSC) manageable. For the ICT technician profile, these amendments lead to an incomplete depiction of the ESCO occupational profile: 40 optional knowledge items from the new profile could not be included, since they were not used in the mapping conducted in the first

part of the study ⁽¹⁷⁾. The resulting ESCO occupational profile includes 36 KSC items (though again, 40 optional knowledge items had to be excluded).

The restructuring of ESCO occupational profiles does not have an impact on the comprehensiveness and relevance of the reference point as such. Average coverage remains at 73%, while median coverage remains at 74%, with coverage corresponding to the share of KSC terms that are either implicitly or explicitly covered in the national qualification. Table 4 summarises this information.

⁽¹⁷⁾ Most of these items refer to programming languages, including ML (computer programming), Objective-C, OpenEdge Advanced Business Language, Pascal (computer programming), Perl, PHP, Prolog (computer programming), Python (computer programming), and many more.

Table 4. Mapping table for ICT technician

			BG
		EQF level	4
Category	KSC Relation Type	Volume of additional LO KSC	high
Knowledge	Optional	ICT market	
	Essential	procurement of ICT network equipment	
	Essential	distributed directory information services	
	Essential	ICT network routing	
	Optional	service-oriented modelling	
	Optional	ICT encryption	
	Optional	R	
	Optional	ICT debugging tools	
	Optional	systems thinking	
	Optional	ICT system user requirements	
	Optional	ICT system programming	
	Optional	computer programming	
	Optional	Microsoft Visual C++	
	Essential	ICT networking hardware	
	Essential	ICT network cable limitations	
Optional	ICT communications protocols		
Communication, collaboration and creativity	Optional	use different communication channels	
	Optional	create solutions to problems	
Information skills	Essential	use repair manuals	
	Optional	provide technical documentation	
	Essential	keep up to date on product knowledge	
Management skills	Optional	manage schedule of tasks	

			BG
		EQF level	4
Category	KSC Relation Type	Volume of additional LO KSC	high
Working with computers	Essential	maintain ICT server	
	Essential	maintain ICT system	
	Optional	configure ICT system	
	Essential	administer ICT system	
	Essential	perform backups	
	Essential	define firewall rules	
	Optional	use access control software	
	Essential	perform ICT troubleshooting	
	Essential	implement ICT recovery system	
	Optional	manage ICT legacy implication	
Essential	manage email hosting service		
Handling and moving	Essential	use precision tools	
Working with machinery and specialised equipment	Essential	operate private branch exchange	
	Essential	repair ICT devices	
Category	Cluster	TSC skills concept	
Language skills and competences	[individual language]	mother tongue	
	[individual language]	foreign language	
Life skills and competences	Adopting environmentally friendly practices (Environmental literacy)	follow environmentally-sustainable work practices	
	Digital skills and competences	ICT safety	
		problem-solving with digital tools	
		digital communication and collaboration	
Working with computers	digital content creation		

			BG
		EQF level	4
Category	KSC Relation Type	Volume of additional LO KSC	high
Self-management skills and competences	Acting according to values	support company plan	
		follow ethical code of conduct	
	Acting independently and showing initiative	work independently	
		identify opportunities	
		demonstrate curiosity	
		demonstrate enthusiasm	
	Dealing with change	adapt to change	
		deal with uncertainty	
	Engaging in self-development	demonstrate willingness to learn	
	Managing negative factors in life and work	cope with pressure	
		manage frustration	
		persist	
	Responding to routine requirements of tasks	follow safety precautions in work practices	
		attend to hygiene	
		meet commitments	
		work efficiently	
		follow hygienic work practices	
attend to detail			
Social and communication skills and competences	Collaborating with others in teams and networks	interact with others	
		work in teams	
	Conciliating and negotiating	negotiate compromise	

			BG
		EQF level	4
Category	KSC Relation Type	Volume of additional LO KSC	high
Social and communication skills and competences	Conveying and exchanging information and ideas	report facts	
		communicate mathematical information	
		manage quality	
		address an audience	
		use questioning techniques	
		use body language	
	Managing and leading others	instruct others	
		lead others	
		motivate others	
		persuade others	
	Showing respect and consideration for others	demonstrate consideration	
		accept constructive criticism	
		support cultural diversity	
		support gender equality	
		demonstrate good manners	
		demonstrate intercultural competence	
	Supporting others	give advice to others	
support colleagues			

		EQF level	BG
Category	KSC Relation Type	Volume of additional LO KSC	4 high
Thinking skills and competences	Acquiring and organising information	manage quantitative data	
		memorise information	
	Adressing problems and issues	make decisions	
		develop strategy to solve problems	
	Analysing and processing information	carry out work-related calculations	
		evaluate information	
		digital data processing	
		carry out work-related measurements	
		process qualitative information	
		use mathematical tools and equipment	
		work with shape and space	
	Creating and innovating	think creatively	
	Planning and organising	apply quality standards	
		manage time	
use learning strategies			
			47%

Source: Cedefop. List of transversal KSC excluded from the ESCO occupational profile.

DK	IE	ES	FR	LT	NL	AT	FI	UK-EN	
4	4	5	4	4	3	4	4	5	
low	none	none	medium	none	none	high	high	none	
									5
									4
									10
									8
									10
									10
									7
									7
									7
									6
									6
									8
									10
									6
									6
53%	86%	97%	56%	30%	73%	72%	90%	57%	

Table 5 shows the profile that emerges when selecting those learning outcomes from the ESCO occupational profile that are covered (either explicitly or implicitly) in at least nine out of the 10 qualifications, producing a set of ‘core learning outcomes’ across the 10 qualifications. For the ICT technician, 10 out of 16 items in this profile are ‘essential’ (as opposed to optional) skills and competences.

The same observation can be made as with the healthcare assistant profile: while the list of occupational KSC included in this core profile is the same as the one that emerged in the first part of the study, the new conceptual structure clearly provides an improved illustration.

Table 5. **Core learning outcomes from the mapping against the ICT technician profile**

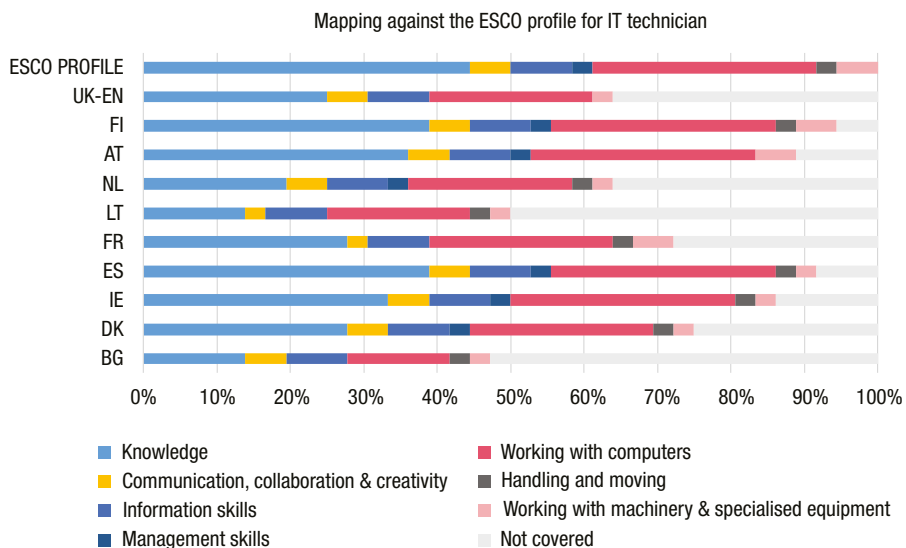
ESCO – new structure		
Level 1 title	Level 3 title	KSC Label
Knowledge	Electronics and automation	ICT network cable limitations
		ICT networking hardware
	ICT communications protocols (optional knowledge)	
	Software and applications development and analysis	ICT debugging tools (optional knowledge)
Communication, collaboration and creativity	Coordinating activities with others	use different communication channels (optional skill/competence)
	Developing solutions	create solutions to problems (optional skill/competence)
Information skills	Interpreting technical documentation and diagrams	use repair manuals
	Documenting technical designs, procedures, problems or activities	provide technical documentation (optional skill/competence)
	Monitoring developments in area of expertise	keep up to date on product knowledge

ESCO – new structure		
Level 1 title	Level 3 title	KSC Label
Working with computers	Protecting ICT devices	perform backups
	Resolving computer problems	perform ICT troubleshooting
	Setting up computer systems	configure ICT system (optional skill/competence)
		administer ICT system
	Working with computers	maintain ICT server
maintain ICT system		
Working with machinery and specialised equipment	Installing and repairing electrical, electronic and precision equipment	repair ICT devices

Source: Cedefop. List of transversal KSC excluded from the ESCO occupational profile. 40 optional knowledge items from the new profile could not be included, as they were not used in the WA1 mapping in order to keep the size of the profile (then also including transversal KSC) manageable.

As with the healthcare assistant, the structured occupational KSC profile allows presentation of the outcomes of the mapping exercise in a generalised and comparable manner.

Figure 5. Mapping against the ESCO occupational profile for ICT technician



Source: Cedefop. List of transversal KSC excluded from the ESCO occupational profile.

2.2.4.5. *Reflections and observations from the revisited mapping exercise*

This new classification introduced cannot eliminate the major shortcomings identified for ESCO occupational profiles to be used for the purpose of analysing and comparing qualifications. The skills concepts remained untouched, i.e. the overall coverage figures resulting from the mapping remain unchanged. However, as observed in the revisited mapping exercise, the classification helps to structure the occupational profile better and visualise the outcomes of the mapping in a more generalised way.

One of the key limitations in the use of ESCO, identified in the first part of the study, was the absence of a conceptual model underlying the approach to ensure consistency in the description of knowledge, skills and competences and the design of occupational skills profiles. The new structured display of occupational profiles can be considered as a first step towards addressing this issue.

The new classification might help provide a more accessible reference point for mapping and comparing qualifications, particularly when the objective is to present the outcome of comparison in a more succinct way (instead of a very detailed analysis item by item): presenting the information from the mapping by aggregating highly detailed information from the technical mapping process.

The added categories for structuring skills concepts also allow for better comparability between different ESCO occupational profiles, as between the healthcare assistant and the ICT technician. A comparison between these two profiles visualises greater emphasis on the ‘knowledge’ and ‘working with computers’ items for the ICT technician, but on ‘communication, collaboration and creativity’ and ‘assisting and caring’ for the healthcare assistant. Taking the number of skills items as an indicator of the importance of a category (as suggested by the visualisation through bar charts) has its flaws and shortcomings, yet it offers a first step to providing a rough overview of the focal points of an occupational profile.

2.2.4.6. *Mapping exercise revisited (transversal KSC)*

As done for the occupational KSC profiles, the ESCO transversal skills were prepared with the new (draft) structure for transversal KSC. As the draft restructuring does not include a definite allocation of each KSC to one of the new categories and clusters, this allocation has been undertaken by the study team and so should only be considered as provisional.

The revisited mapping exercise based on the new draft classification for ESCO transversal KSC yields some additional insight concerning the weight

of different KSC categories. This leads to an improved illustration compared to the 'old' structure of transversal KSC.

When comparing the healthcare assistant profiles with the IT technician profiles, the latter tend to show a higher coverage in the areas of both thinking skills and life skills, especially in the cluster of digital communication and collaboration. This is illustrated in Table 6 by a larger share of shaded cells, and highlighted through red rectangles. The healthcare assistant profiles, in contrast, tend to show a higher coverage of transversal skills pertaining to the 'social and communication skills and competences' category, although the difference is less marked here.

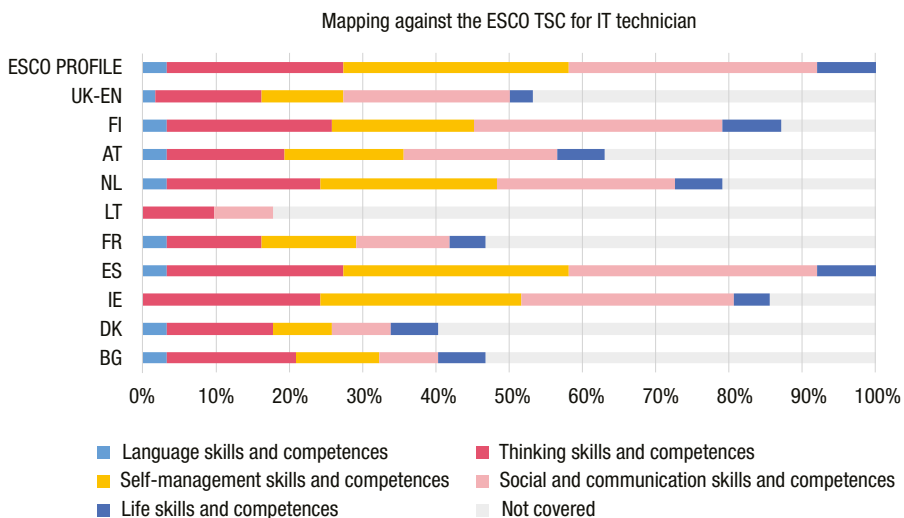
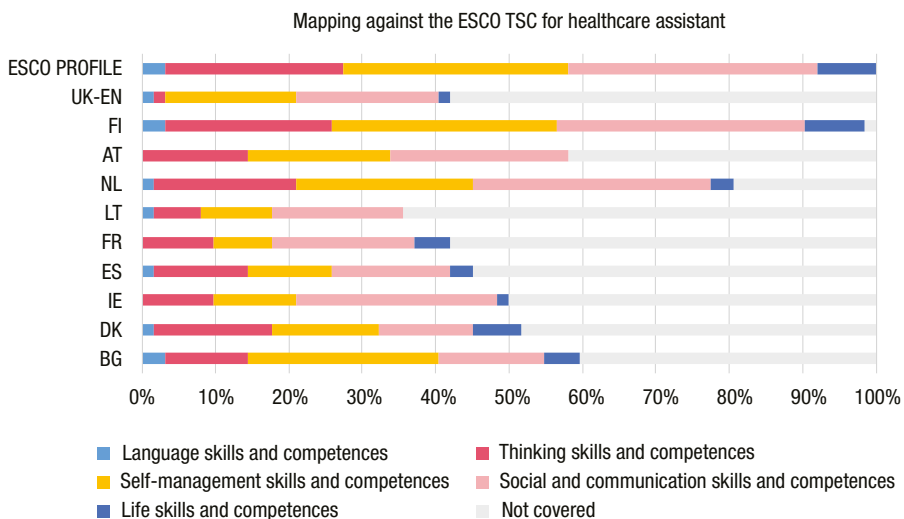
Figure 6 presents a different illustration of the same mapping against ESCO transversal skills and competences, offering another perspective for the weight of different KSC categories. The Bulgarian healthcare assistant qualification used for the mapping shows an overall coverage slightly above the median value, but a comparatively high coverage of KSC pertaining to the 'thinking skills and competences' category. Conversely, the Irish health assistant qualification shows an overall coverage slightly below the median value, but a comparatively high coverage of KSC pertaining to the 'social and communication skills and competences' category (depicted in the yellow section of the bar). For the UK qualification, very low coverage of KSC pertaining to the 'thinking skills and competences category can be observed'.

			Healthcare assistant							
			BG	DK	IE	ES	FR	LT	NL	AT
Category	Cluster	KSC EQF level	4	4	4	3	3	3	3	n/a
Thinking skills and competences	Acquiring and organising information	manage quantitative data								
		memorise information								
	Addressing problems and issues	develop strategy to solve problems								
		make decisions								
	Analysing and processing information	carry out work-related calculations								
		carry out work-related measurements								
		digital data processing								
		evaluate information								
		process qualitative information								
		use mathematical tools and equipment								
		work with shape and space								
		Creating and innovating	think creatively							

			Healthcare assistant							
			BG	DK	IE	ES	FR	LT	NL	AT
Category	Cluster	KSC EQF level	4	4	4	3	3	3	3	n/a
	Planning and organising	apply quality standards								
		manage time								
		use learning strategies								

Source: Cedefop.

Figure 6. Mapping against the ESCO transversal skills and competences



Source: Cedefop.

2.2.5. Preliminary conclusions

It can be concluded that the ideal reference point might be one that is comprehensive, but not too complex and adaptable to different needs and users/applications. In general, the KISS principle applies ('Keep it simple, stupid!'). As the revised ESCO mapping exercise has shown, a well-structured reference point is important as it supports the analysis of qualifications and the comparison process and provides a better overview of the results. As ESCO lacks the important aspect of systematically expressing performance levels, it might be useful to consider how this could be integrated and whether, and to what extent, for example, the approach of the world reference levels or the VQTS model could be used in this respect. Further, it could be considered how it is possible to express a weighting when mapping learning outcomes contained in qualifications to ESCO occupational profiles.

However, in addition to the conceptual shortcomings of the current state of ESCO and general limitations for comparing qualifications when focusing on learning outcomes only, limitations of occupational skills profiles when used as reference points also have to be considered: Labour markets are fluid and dynamic, the contexts are constantly changing. This requires constant updating of occupational skills profiles and also means that they can never be complete⁽¹⁸⁾. The framework for a global skills taxonomy proposed by the World Economic Forum could be used as a source of inspiration in this regard: it 'builds on the recognised work taken forward by ESCO (European skills, competences and occupations) and the Occupational information network (O*NET) framework by integrating additional emerging skills and attitudes, particularly as they relate to the trends highlighted in the Forum's ongoing insights on the future of work. It aims to take a matrixed approach that combines skills and occupations' (World Economic Forum, 2021, p. 2)⁽¹⁹⁾. The development and constant updating of ESCO occupational skills profiles, however, would require a high level of commitment and resources. These would be quite expensive systems and the cost-benefit ratio need to be considered: how do we justify the costs?

Multilingual occupational skills profiles as reference points are useful for the international comparison of qualifications, although only to a limited

⁽¹⁸⁾ Concerns are expressed in relation to ESCO: 'One danger with such an approach is that ESCO simply mirrors the skills of yesterday and is unable to envisage or encompass changes required, whether in the labour market or the VET system' (Clarke et al., 2020, p. 10).

⁽¹⁹⁾ It is also suggested that this taxonomy could be used to define levels of performance for emerging skills (World Economic Forum, 2021, p. 15).

extent as they lack relevant contextual information. This also leads to the question of translation and the validity of the translation and to the conclusion that these reference points can always only provide an approximation.

There is also a risk that reference points may be used as standards (which entails the risk of reducing linguistic and cultural diversity), even though they were actually intended solely for enhancing transparency and comparison, without any normative function.

2.3. Data sources for national VET qualifications

2.3.1. Lessons learned

In the second part of this study, a set of criteria or conditions that need to be in place to support comparison of VET qualifications was introduced. This built the basis for a template to analyse the data sources for qualifications (reference documents as well as qualifications databases or registers) in the 10 countries covered by the study. The template was completed by country researchers, mainly based on desk research. Expert interviews were also conducted to validate the results and/or fill information gaps. If relevant, the qualification of the ICT service technician was used as an example to illustrate certain aspects.

The following sections first discuss observations related to the available documents for presenting qualifications, before reflecting on qualifications databases and their usability for supporting comparison of qualifications.

2.3.1.1. *Documents as key data sources for VET qualifications and learning outcomes*

The analysis points to an increasing transparency of national qualification descriptions as the detail of learning outcomes is included in most reference documents; this is usually along with an indication of the NQF or EQF level and additional contextual information, and together supports better understanding of qualifications. This provides many opportunities since transparency is a necessary condition for the comparability of qualifications. Nevertheless, there are still several challenges for the international comparison of qualifications.

(a) Analysis of qualification-related documentation shows that learning outcomes are structured and expressed in a wide variety of ways. Any procedure for comparing qualifications will need to be able to cope with

this diversity, in the absence of a common format among countries for presenting learning outcomes.

- (b) In relation to different types of learning outcomes (general, occupation-specific, transversal) these are seldom identified separately. Even within countries, there may be mixed approaches in use, so that some modules of qualifications may integrate occupation-specific and transversal learning outcomes, while there are also occupation-specific modules without any transversal outcomes (and vice versa). Such variation can also be found between qualifications in the same country, where national regulations do not cover this dimension and where different groups – responsible for the writing of learning outcomes – have adopted different approaches.
- (c) Similarly, the domains of learning (such as knowledge, skills and competences, KSCs) are not often separately specified; when they are used for structuring, different approaches are used across countries.
- (d) Learning outcomes are also structured in terms of different levels of specificity, so that it is quite common to find an ‘upper’ level of learning outcomes written in a more general way, with more detailed learning outcomes ‘below’. However, the way in which learning outcomes are structured differs, as does the granularity of the descriptions. This may influence the comparison of qualifications, to the extent that it is difficult to compare descriptions at different levels of abstraction; for example, it may open up some room for interpretation, as it is not immediately clear which detailed learning outcomes could be summarised in more abstract statements. It would be helpful to identify a similar ‘description level’ when comparing qualifications.
- (e) A systematic approach for expressing the complexity of learning outcomes (the performance level, i.e. the ‘vertical dimension’), such as the use of taxonomies, can be observed only in a few cases. Sometimes even a resistance to using taxonomies can be observed. The reasons for this are not always clear but, in some cases, they are tied in to the issue of balance between centralising the structure and content of learning outcomes, on the one hand, and allowing flexibility between sectors and occupations in qualifications design, on the other hand.
- (f) Variation also exists in the degree of autonomy within systems to adapt elements of qualifications, such as adapting learning outcomes to local labour market needs. This variation means that qualifications at a ‘lower hierarchical level’ (regional or provider) can differ from the ‘higher’ (na-

tional) documents to which they refer, as well as differing from each other. The extension of cross-country comparison to the regional or provider level would require additional efforts, but might be worth doing since it must be recognised that the ‘lower-level’ documents may be more relevant to stakeholders at the regional or provider level than those at the ‘higher hierarchical level’.

- (g) It can be difficult to compare qualifications where optional elements and electives are included, which could be an effect of reducing the number of qualifications and broadening the qualification profiles, a quite common trend in Europe ⁽²⁰⁾. There can be differences between individuals holding the same certificate, for the same qualification, in terms of the learning outcomes they have sought through the qualification. Sometimes these differences may be quite substantial. This suggests that any method for comparing qualifications will need to determine both the core and optional elements of qualifications, and, more than this, it may need to acknowledge that in certain circumstances it may make sense to compare only the ‘core’ elements of a qualification.
- (h) The question of accessibility of qualifications data also needs to be addressed. For national qualifications, the most relevant aspect is whether the data at national level are accessible and traceable; the place of storage is secondary. Findings show that relevant qualifications documents are not available in all countries or not for all levels (e.g. qualifications descriptions at regional or provider level are not always publicly accessible). The infrastructure behind the learning outcome descriptions is only in a few cases designed in a way that permits a simple extraction of the learning outcomes for different applications.

2.3.1.2. *National qualifications databases*

The analysis of the databases for storing and presenting qualifications, available in the countries covered by this study as of mid-2019, revealed a need for a commonly agreed definition of what can actually be considered to be a ‘qualifications database’. Up to now, hugely varied developments in national qualifications databases can be observed. The common principles for presenting learning-outcomes-based qualifications in databases, suggested by Cedefop (2017), are rarely used and few are linked to the European portal.

⁽²⁰⁾ This is, for example, pointed out in the Cedefop study on the changing nature and role of VET (Cedefop, 2020) and currently further elaborated in the [Cedefop project on the future of VET](#).

In general, the databases analysed in the 10 countries covered by this study support the cross-country comparison of qualifications – and particularly the use of digital tools for this purpose – only to a limited extent. This needs to be considered in future discussions on what the purpose of qualifications databases should actually be.

However, the research also shows that qualifications databases are emerging or are currently being developed further and newer databases are being set-up in relation to the elements of data fields suggested by the EQF Recommendation (Council of the European Union, 2017). This ‘work in progress’ points to opportunities that could be further elaborated in the future, in order to support the international comparison of qualifications and the potential applications of this exercise for different target groups and needs.

2.3.2. Preliminary conclusions

An imperfect situation was noted with regard to the data sources of qualifications, which makes their international comparison difficult. VET qualifications are mainly developed and described for the national context, not for comparison; they reflect the different national traditions and strategies and the different ways in which influences from the European level are taken up in that context. There are problems related to the transparency and accessibility of national data on qualifications, which also affect the possibility of using digital tools to analyse qualifications (see discussion in Section 2.4.2).

- (a) Further efforts are needed to find solutions to improve access to data on qualifications, and to improve transparency to support the analysis and comparability of qualifications and their learning outcomes. Short, not too detailed, presentations of qualifications should be developed that do not provide the full account of the learning outcomes of a qualification, but a synthesised and structured description of their core profiles.
- (b) The Cedefop handbook on learning outcomes offers guidance, suggesting the following components as a basic structure to formulate learning outcomes statements: action verb and object of the verb, as well as a statement specifying the depth/breadth of learning to be demonstrated, and with an indication of the context (which can be related to learning, work or other relevant social contexts). Learning outcomes statements should express the level of complexity or proficiency (i.e. the ‘vertical dimension’ of learning outcomes). Taxonomies and the action verbs included can be used for this purpose but should serve mainly as a reflective

tool, to support dialogue in the development and description of qualifications, and not too rigidly.

- (c) It is recommended to explore further the development of common principles and a common structure for developing qualification profiles for the European context. This could also support the automated analysis and comparison of qualifications. These common principles and the common structure could be based on the elements of the Europass certificate supplement; the data fields for the electronic publication of information on qualifications (Annex VI in the EQF Recommendation); and the common principles for presenting learning-outcomes-based qualifications as proposed by Cedefop. It is suggested developing standardised learning-outcomes-based descriptions of national qualifications (of about 2 500 to 3 500 characters). These descriptions should follow a predefined structure and syntax, refer to a sensible and flexible way of clustering types of learning outcomes, and should be based on a standardised terminology, including lists of action verbs (which should not be used too rigidly). This would mean a more harmonised approach for presenting learning outcomes statements in the European context, which in turn would enhance the comparability of qualifications.

2.4. Digital technologies for analysing and comparing qualifications data

2.4.1. Lessons learned

In the first step of the second part of the study, focusing on the use of digital tools, the requirements to be met by such tools were defined. Ideally, the digital tool supporting the automated analysis and comparison of learning outcomes of VET qualifications should:

- (a) have the ability to process different text formats (prior conversion or automated); allow extraction or labelling of key words; have the ability to deal with natural language (text parsing);
- (b) be able to process different languages;
- (c) use open-access software packages to maximise inclusivity; this should not be too demanding to operate.

In a second step, a workflow was designed, outlining the separate sub-tasks that would be involved for the automated analysis and comparison

of qualifications (within a context of text mining, text analysis and machine learning) and to identify existing or new digital technologies (preferably freeware) that could potentially be used for the purpose of automated analysis and comparison of qualifications. The sub-tasks of the proposed workflow include the following, in a more or less chronological sequence (i.e. pipeline):

- (a) first, access to national VET qualifications in machine readable form (tap relevant sources, transform pdfs into text, point the parser at the spot where the learning outcomes are being described) has to be provided ⁽²¹⁾;
- (b) the national learning outcomes descriptions need to be parsed (text segmentation, part-of-speech-tagging) and the segmented text parts of national learning outcomes descriptions need to be mapped onto the reference vocabulary, representing the associated meaning, in terms of the reference vocabulary (normalisation of learning outcomes);
- (c) in the final step, the ‘translated’ national learning outcomes descriptions have to be mapped onto the most suitable occupational skills profiles (‘reference points’) of the reference system, registering overlap and divergence.

The development of the prototype (digital tool) included selecting a set of base tools to work with and tailoring solutions provided on discussion forums to fit the workflow through trial and error. Additionally, experts were consulted for feedback on the proposed workflow, as well as on the use and feasibility of incorporating machine learning aspects into it. The suggestions and feedback from experts consulted referred to the following aspects: the aim should be to support rather than fully automate the process; the feasibility of integrating machine learning depends on the amount and diversity of data to be processed; and implementing a machine learning approach should require significantly less effort than carrying out the comparison manually.

The adapted approach to developing a prototype included narrowing the focus on certain processing subtasks and using the whole reference system (ESCO skills pillar, v103), rather than preselected reference points (occupational skills profiles) only. It was not feasible to perform all of the envisioned ‘workflow steps’ for the final prototype within this project. The

⁽²¹⁾ The challenge of this sub-task is that qualifications descriptions are not always written as learning outcomes; even when they are, learning outcomes may play different roles within different qualifications. There is also the question of the level at which learning outcomes are located.

prototype developed for the testing exercise is a collection of resources that can be used through an open-source Python programme (Anaconda Navigator). The testing exercise was conducted to analyse to what extent the texts included in the Dutch national documentation for the qualification of ICT service technician (core tasks/work processes) could be matched to the right skills in ESCO.

The results of the testing suggest differences between the languages used in ESCO and in national qualification descriptions. When focusing on single terms as well as on bigrams (word pairs), present within ESCO, a highly skewed frequency distribution was found (e.g. a high share of terms – 46.2% – occurs only once). However, some more commonly used tokens or bigrams were linked to so many skills (100+ for single tokens) that manually identifying the ‘correct’ matches – within their professional contexts – would require a significant increase in human capacity for each separate term/skill to be compared, which is undesirable.

The results of the testing exercise concluded that the national qualification descriptions and the selected reference point differ too much to allow sensible matching, based on automated processes. There are also too few qualification data available for the training of an automated system for comparing qualifications (i.e. machine learning is not a feasible approach). The study showed that there are currently limited possibilities for automated qualification comparison; even machine learning methods (artificial intelligence, AI) are currently only partly able to support a manual comparison in such a way that these efforts are significantly less labour-intensive.

2.4.2. Preliminary conclusions

Some of the suggestions for improvement mentioned for the reference system used, the ESCO skills pillar, are also relevant for this exercise. Provided that the necessary information related to data on qualifications is extracted beforehand, it is possible to use the prototype developed for some preliminary analyses, potentially contributing to the improvement of ESCO, with the goal of developing it into a lexical resource also suitable for natural language processing; this could involve identifying specific terms within ESCO (or between ESCO and learning outcomes descriptions from other sources), which are most likely to cause mismatches (ambiguous terms, similar but different terms that would be those identified as one after stemming). Only after this challenge has been met, may we consider using machine learning elements for (supporting) the mapping of learning outcome descriptions to

ESCO skills. If the project is limited to one language (English), it would be possible (through translating qualifications described in other languages into English) to prepare enough data manually for training a classification model for the full ESCO skills pillar. However, given that a word has a meaning in a specific sentence, it might have another meaning in another context. There are also ambiguities in the language that need to be considered; since it often appears to be difficult for humans to have a common understanding, this might be even more challenging for machines, so translations will further increase the complexity. As seen in other projects (such as on vacancy analyses), there is generally an ongoing process of training and updating the model, especially considering terminology changes over time. A harmonised language repertory is prerequisite to any form of automation in comparing qualifications; looking at other countries dealing with the qualification-comparison problem over decades, e.g. Canada's francophone versus anglophone needs, can reveal to what extent and in which manner they have solved the problem.

Some activities for further improving ESCO have already been described and they are continuing. Another project in the ESCO-context that was carried out to contribute to the potential use of digital tools for analysing and comparing qualifications is presented in Section 2.4.3.

2.4.3. Other relevant activities

Other projects and activities have tested approaches for using digital tools for mapping learning outcomes of national qualifications to ESCO skills.

The Qualifications pillar study (European Commission, 2019), carried out in 2018, was commissioned to provide insights into how the learning outcomes of qualifications included in the ESCO qualifications pillar could be linked with the ESCO skills pillar, and how technical tools could provide the most effective and cost-efficient solution. A proof of concept was developed to illustrate and explore how linking could be automated, what technical approaches work best, and to understand the resource requirements for the possible approaches. The study discussed different options, including a wholly 'human' solution (manual linking) and a highly intensive artificial intelligence solution; it also 'shows the potential for a more pragmatic solution which embraces both the best use of human and technologies' (European Commission, 2019, p. 8).

Following up on the conclusions of this study – based on the experiences from the testing exercise related to (semi)automated linking for eight

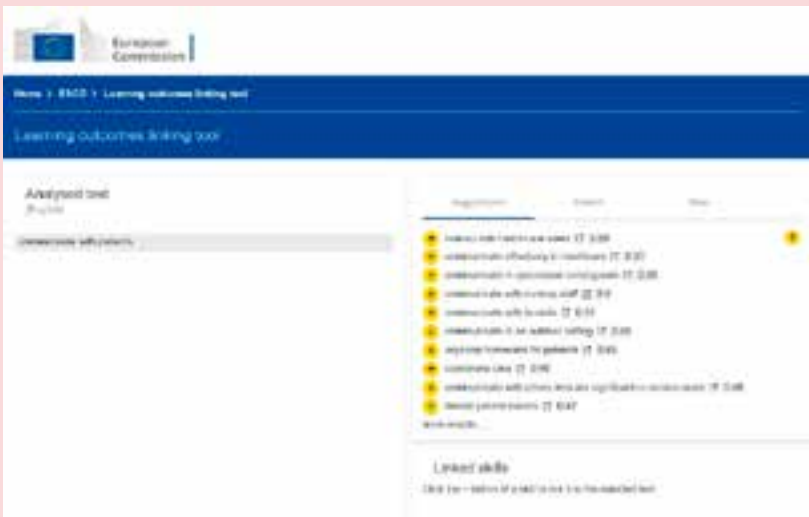
qualifications – ‘the Commission decided to test the use of an automated approach based on methods for natural language processing with an initial degree of human intervention’ (European Commission, 2020d). A pilot project for Linking learning outcomes of qualifications with ESCO skills was conducted for further testing the linking with qualifications from different countries, in different EU languages, with different EQF levels and in different subject areas. A user-friendly IT tool has been developed to support the linking process based on natural language processing, providing automatic suggestions for ESCO skills on learning outcomes of selected qualifications in different EU languages. This IT tool has the following three main functionalities (European Commission, 2020d, p. 3):

- (a) ‘split learning outcomes description texts into separate conceptual entities;
- (b) provide suggestions of matching ESCO skills through a machine learning algorithm;
- (c) export a list of ESCO skills concepts that relate to the learning outcome of the qualification.’

Box 4 illustrates how this tool can be used to support the mapping exercise (as described in Section 2.2.3).

Box 4. Mapping exercise, supported by the learning outcomes linking tool

For supporting the mapping exercise, users can type in learning outcomes descriptions from their national qualification descriptions (with or without selecting one of the suggested languages) and the tool will provide suggestions of matching ESCO skills through a machine learning algorithm. Then the skills concept that fits best to the learning outcomes description in the national qualification can be selected. This is illustrated in the figure below that shows the results generated when typing in the learning outcomes description text ‘communicate with patients’. The suggested ESCO skills concept ‘interact with healthcare users’ could then be selected by clicking on the + button and it would appear in the list of ‘linked skills’.



This can be repeated for the whole qualifications profile. It is then possible to export a list of ESCO skills concepts that relate to the learning outcomes of the qualification and is also included in the respective ESCO occupational profile.

Source: Cedefop.

The pilot project Linking learning outcomes of qualifications with ESCO skills demonstrated that an automated approach based on the use of artificial intelligence provides for a significant reduction in the costs and resources needed to perform the exercise and makes the process more sustainable for

public authorities. However, in line with the findings from the testing exercise carried out within the Comparing VET qualifications project, it was pointed out that the ‘human component is fundamental in order to understand the context of data and review and validate the results provided by AI and machine learning technology’ (European Commission, 2020c, p. 3). Also, the need for sufficient data and information to train the AI algorithm in all languages was emphasised. The pilot project also referred to the potential of how such exercises, and particularly the use of technologies based on natural language processing, can support the feedback process for further improving ESCO.

In 2020, the pilot project was extended with the following objectives for the second phase (European Commission, 2020d, p. 2):

- (a) ‘improve the technology supporting the automated linking of learning outcomes of qualifications with ESCO skills, through an enhanced matching algorithm based on artificial intelligence;
- (b) test the automated linking and the performance of the matching algorithm in different EU languages;
- (c) test the usability of the hierarchical structure of ESCO skills and introduce rules and matching relations between skills and learning outcomes of qualifications, allowing users to define exact matches between skills and learning outcomes or attribute broader/narrower properties;
- (d) develop guidance materials to support countries interested in creating such links;
- (e) make suggestions on the ESCO skills pillar that will feed into the ESCO continuous improvement process.’

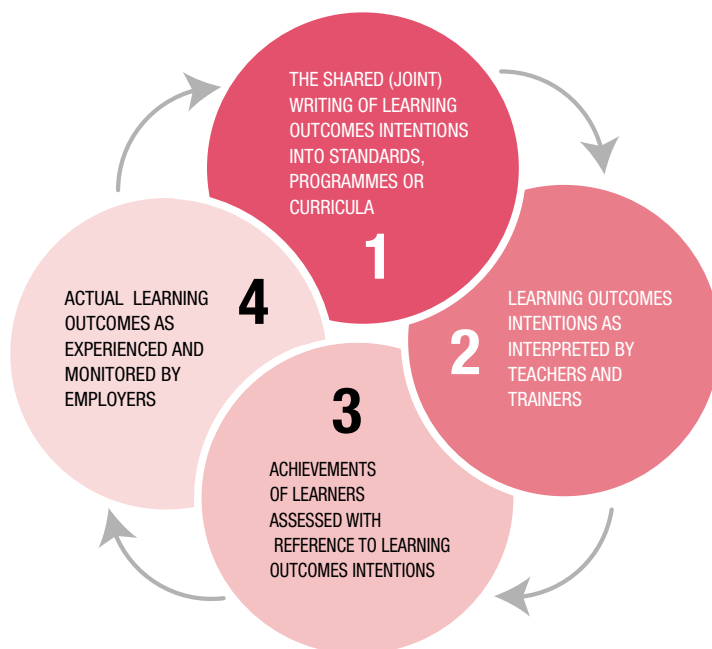
After this second phase of the pilot project, it is expected that an improved IT tool will be available (reflecting the new hierarchy of skills and knowledge of ESCO) and that the quality of the results delivered by the IT tool will also be improved (based on the use of a wide range of data for training the matching algorithm and adapting it to the different EU languages). The potential use cases and applications presented in Chapter 3 of this report will refer to the advantages provided by this IT tool when using ESCO as reference system for analysing and comparing VET qualifications.

2.5. Completing the feedback loop between VET and the labour market

2.5.1. Lessons learned

The third part of this project focused on methods and approaches for exploring, gathering and analysing data on the match/mismatch between qualifications and labour market requirements. Focusing on this aspect should not mean that meeting economic needs is the only purpose of VET: this is not the case, as in many countries VET also provides general education, gives access to higher or further education programmes and also serves social purposes. These other purposes of VET should not be neglected and should be taken into account in the revision and further development of qualifications. However, the central focus in the third part of the project was on what methods can be used to identify labour market needs better and incorporate them in the revision of qualifications. Particular emphasis was put on the feedback loop between VET and the labour market based on learning outcomes; this means continuous dialogue on intended and acquired learning outcomes, trying to improve the stated expectations (intended learning outcomes) on the basis of actually acquired outcomes as applied and perceived in the labour market ⁽²²⁾. This feedback loop is presented in Figure 7.

⁽²²⁾ This loop focuses on the feedback between VET and the labour market. Another feedback loop could be established between VET provision and further learning opportunities. For example, higher education institutions could reflect on the competences of students with a VET qualification and the extent to which they have the competences required to study at a higher education institution. This reflection could also be used by VET providers when reviewing their provision to ensure that the programmes they offer and the associated learning outcomes provide a solid foundation for higher education study, if applicable.

Figure 7. **Learning outcomes feedback loop**

Source: Cedefop.

This study first explored what data are already available in the countries, showing the relevance of qualifications for workers, employers and other labour market actors, and in particular the match between the intentions of the VET system and the needs of the labour market. We examined VET graduate tracking surveys, skill mismatch analyses and the European skills and jobs survey, online vacancy advertisements, including Cedefop's Skills-OVATE, forecasting procedures at national level and Cedefop's pan-European skills, as well as employer reflection surveys. Particular emphasis was placed on the extent to which these approaches are useful in completing the feedback loop based on learning outcomes: whether they consider actual acquired learning outcomes as experienced and monitored by employers (see Stage 4 of the figure).

The analysis of these methods and tools showed that they provide rich insights into the degree of match between skills supply and demand, into current skill demands and future trends, and that they all provide important data for the creation of skills intelligence. However, they are usually not

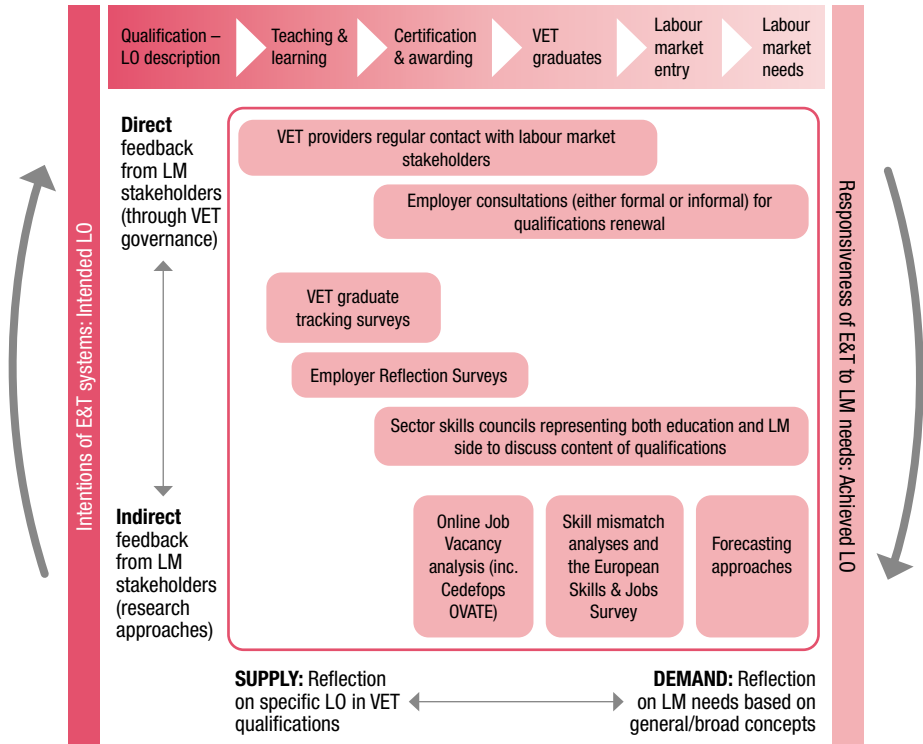
sufficient to complete the feedback loop, as they often refer to a higher aggregated level rather than to individual qualifications and generally do not relate to the perception of the learning outcomes acquired by graduates and realised on the labour market. They are also often biased, as they primarily or even exclusively focus on the demand side (labour market) and do not sufficiently consider the supply side of skills, the provision of education and training and the various related purposes beyond meeting labour market needs.

VET graduate tracking surveys could be considered, at least in part, as approaches to closing the feedback loop (and they often consider other post-graduation pathways or purposes that might be associated with the VET qualification, in addition to labour market integration). However, in many cases, they focus on more general issues and only in a few cases on specific learning outcomes. They are concentrated on the graduates and do not consider the employers' perspective or explore whether the intended learning outcomes are actually acquired.

Employer reflection surveys, defined as approaches in which employers (or their representatives) are asked to give their reflections on the relevance of qualifications in the labour market, could play an important role in completing the feedback loop, as they can examine whether employers are generally satisfied with the graduates and the learning outcomes they bring to the workplace. In the 10 countries included in this study, we identified surveys that address employer perception of and demand for qualifications, and employer reflection surveys without or with reference to specific learning outcomes included in qualifications. The latter could be seen as the most direct means of monitoring the link between intended and actual or realised learning outcomes.

Figure 8 provides an overview of the approaches analysed for closing the learning outcomes feedback loop between VET and the labour market and positions them related to their focus: demand or supply side on the one hand, and individual qualifications and learning outcomes or broader categories on the other.

Figure 8. **Positioning the approaches and tools analysed for closing the learning outcomes feedback loop**



Source: Cedefop.

Employer reflection surveys are, however, usually not conducted in a systematic way at national level. The examples identified in the countries covered by this study show a variety of different approaches and there are several challenges associated with their design. Their usefulness in illustrating the match between the intentions of the VET system and the demands of the labour market seems to be assessed higher in countries with weaker governance and system links between the labour market and the VET system. In countries where there are already strong links and functioning feedback mechanisms between the labour market and the VET system, the introduction of regular employer reflection surveys might even be perceived by stakeholders as an unnecessary administrative burden. Further, in countries with dual systems (apprenticeships), specific approaches to

collecting feedback from employers need to be used, as employers are not only recipients of what the education and training system delivers and have a need for a certain set of skills, but they are involved in the supply process during the in-company training itself. Based on the research conducted, it can be assumed that such surveys provide the most direct added value for VET providers (VET schools or centres) ⁽²³⁾, and not necessarily for the VET system level. If they are conducted at the provider level, they offer the VET providers an additional tool to engage with their graduates and the employers in their region, to initiate a dialogue with them, in order to inform the further development of their offers.

Within the framework of this study, a prototype of an employer reflection survey was developed which focused on the VET provider (school) level. The objective was to develop a tool for supporting VET providers to match their offers better to the needs of their direct labour market stakeholders. Rather than as an accountability tool, it is understood as a tool to initiate dialogue between VET providers and employers (and graduates). Data collection should also allow aggregation to sectoral, national and cross-national levels. While the focus of this part of the study is somewhat different from the previous parts, which were strongly focused on the analysis and comparison of qualifications, this aggregation of data should also allow for comparison at different levels.

It was decided to test the prototype for two profiles (healthcare assistant and ICT technician) in two countries (Lithuania and the Netherlands). For the pre-test of the online survey, three questionnaires were developed (in English and translated into Lithuanian and Dutch): for VET providers, graduates and their employers. First, VET providers were asked to complete the questionnaire and to send the graduate link to the questionnaire to their recent graduates. Originally, the workflow envisaged that the VET graduates who completed the questionnaire would then provide contact details of their employers, who would then be invited to complete the questionnaire for employers. However, the approach had to be changed because few VET graduates provided contact details of their employers (possibly because they feared that this survey would be an assessment of their competences). Therefore, VET providers were asked to compile a list of employers who

⁽²³⁾ The situation is different for companies that offer vocational training (e.g. apprenticeship training): they will probably only hire those graduates with whom they are satisfied and they have the opportunity to use directly the experience gained from each training process to improve their vocational training offering as much as possible (while respecting national or sectoral standards).

might potentially have hired (recent) graduates from their programme and these were then asked to complete the questionnaire.

Since the survey was designed as a tool to complete the feedback loop on learning outcomes, the respondents were asked to reflect on these learning outcomes. Each questionnaire presented a set of skills (as a reference point) and included related questions, e.g. to what extent the VET programme had provided the graduates with skills for effective work in a company/organisation and which of them were rated as the five most important and the five least important. It was considered crucial to use a reference point that would allow for a reasonable assessment of competences, striking a balance between occupation-specific and general competences, while keeping the total number of competences at a manageable level suitable for use in this context. A common set of skills was required to enable comparison between qualifications. A tailor-made reference point was developed consisting of the following skills clusters ⁽²⁴⁾:

- (a) general occupation-related skills and competences as exercised in the workplace (total six learning outcomes);
- (b) specific occupation-related skills and competences as exercised in the workplace: this cluster differs per qualification. In the pilot for healthcare assistant and ICT technician, the list of 11 learning outcomes is based on the learning outcomes mapping to the ESCO profiles conducted in the first part of the overall project. The skills identified as part of the core profiles were selected: i.e. those that were included in qualifications from at least 8 out of the 10 countries;
- (c) teamwork and interpersonal skills as exercised in the workplace (six learning outcomes);
- (d) employability and enterprise skills as exercised in the workplace (15 learning outcomes).

The analysis and the feedback from the respondents show that the skill lists used were considered detailed enough to allow in-depth reflection on the content of the qualifications, but short enough (38 items) to be used in such a survey without burdening respondents with cumbersome skill lists: the average time taken by employers to complete the full survey was 15 minutes. The structure with the four clusters worked well and allowed

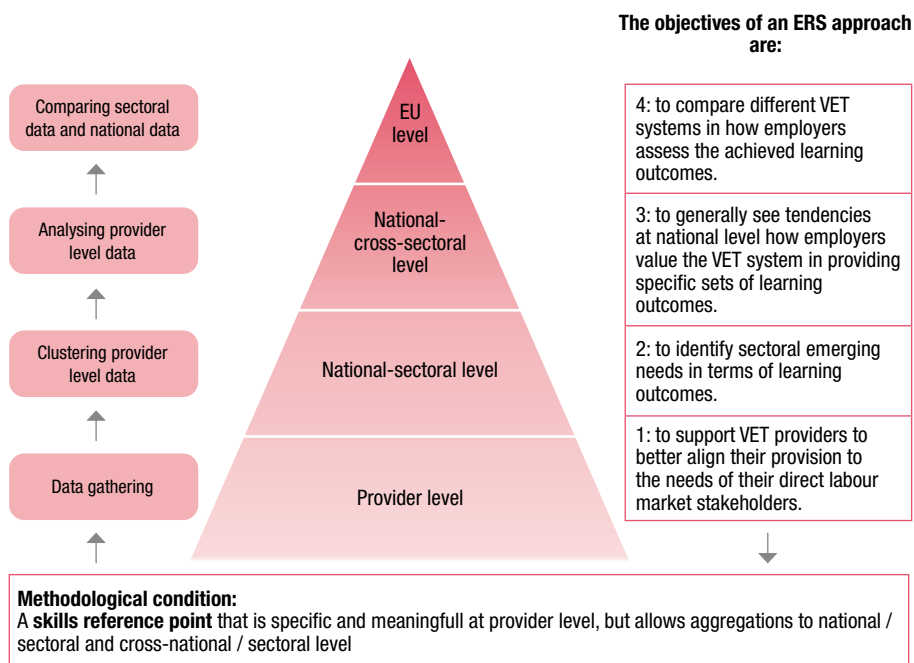
⁽²⁴⁾ The development of this reference point was inspired by an Australian employer satisfaction survey (Social Research Centre, 2019) and the ESCO skills pillar.

comparisons between the two qualification profiles. The occupation-specific skills list seemed to work better for the healthcare assistant than for the ICT technician; the skills listed for the latter were less well recognised by VET providers, graduates and employers.

The main challenge experienced in the pilot exercise was reaching out to VET graduates and their employers. This was partly a result of the generally difficult period around the COVID-19 pandemic, during which the pre-test of the survey was conducted, and with a focus on occupational fields that were of central importance in this situation. In order to reach graduates and their employers, however, VET providers must have up-to-date data on their graduates and operate an active alumni policy. Such a policy existed among VET providers for whose graduates a good response rate was recorded in the survey, but it seems that the other VET providers did not have a sufficient alumni policy. The pre-testing exercise also showed that establishing contact with graduates and employers in the ICT sector was even more difficult than in the healthcare sector. In ICT, there is a less clear idea of who the employers of graduates are, as the sector is characterised more by SMEs. The labour market is also less regionally limited compared to the healthcare sector, and there appears to be a dynamic in the labour market that is related to the fact that these graduates change jobs earlier in their careers than healthcare graduates.

Nevertheless, the pre-testing exercise suggested interesting results and opportunities. For example, different perspectives of the three types of respondents (VET providers, employers, graduates) on the extent to which the VET programme has actually provided the graduates with specific skills for effective work in a company/organisation, and on the most important and least important of the listed skills, can be used to start a dialogue on how to improve VET provision. Comparison of results in relation to different VET providers, different sectors and countries can serve as a stimulus for the review and renewal of qualifications. Figure 9 presents the objectives and opportunities that the employer reflection survey (ERS) provides.

Figure 9. Objectives and opportunities of the ERS approach



Source: Cedefop.

2.5.2. Preliminary conclusions

At least in some VET contexts, more work needs to be done to ensure that the achieved learning outcomes of graduates as perceived by their employers are considered in the review and renewal of VET qualifications. Relevant methods should be integrated more strongly into VET governance and quality assurance procedures and structures. This requires not only relying on feedback mechanisms at national or system level, but also strengthening more direct feedback loops between VET providers and their (local or regional) labour market stakeholders. A combination of different sources and methods is recommended, as each of them has its specific advantages, provides special insights into the relevance of qualifications and can add value for a particular purpose, thus helping to create skills intelligence. The use of skills intelligence and feedback loops is also emphasised in a recent discussion paper by Cedefop and ETF (2020, p.11): ‘...in a fast-changing and uncertain economy, the development and use of labour market and skills intelligence and strategic foresight is essential to informing VET policy, prac-

tice and potential learners as part of a well-defined skills governance framework and infrastructure. It is also important to create direct communication lines and coordination mechanisms (feedback loops) between VET actors and the economy.’ While much research has been done on labour market needs, more needs to be done on exploring and ensuring the relevance of VET qualifications to these needs. The feedback loop on learning outcomes can serve as a key reference point in this dialogue between the world of work and the world of education. The approach of the employer reflection survey provides a kind of ‘reality check’ for VET providers as to whether their offer of VET qualifications (and the associated learning outcomes) is also perceived by employers as acquired by graduates and as important for the specific work context.

However, there are also some challenges to be considered. One concerns the interpretation of the data collected: there might be problems with subjectivity on the part of the respondents. Employers may reflect on the competences of their employees but do not know the source of the competences, i.e. how and where they were acquired. The assumption of the existence of a direct link between intended and acquired learning outcomes is a simplification, which leaves out the fact that competences can be acquired in different ways and in different contexts. Someone may have acquired teamwork skills in community work, but the employer would probably not know that they were acquired in this context and not in the VET programme: it is then questionable how the employer’s feedback on this can be used to draw conclusions about the learning outcomes included in the VET programme, so more conceptual work is needed in this regard.

Since the prototype of the employer reflection survey was only pre-tested within this project and with a limited number of respondents, further development and experimentation is suggested. This could include setting up an infrastructure inspired by the SELFIE 360-methodology, to allow VET providers to conduct self-assessment supported by input from different stakeholders ⁽²⁵⁾; this can include additional or other countries for which this approach is of interest, more VET providers and other qualification profiles. The further testing could be combined with support to VET providers to

⁽²⁵⁾ See [How SELFIE works](#).

develop their policies on employer engagement as well as alumni policies ⁽²⁶⁾ and also to build sufficient capacity to conduct such surveys and analyse and interpret the data gathered. The results of employer reflection surveys at national or system level could be combined with information from other sources for completing the feedback loop. Overall, this approach could be further explored and developed within the EQAVET Framework in the context of the implementation of the VET Recommendation (Council of the European Union, 2020).

2.6. The importance of learning outcomes going forward

The activities carried out in the different parts of this study have clearly shown the opportunities offered by the use of learning outcomes. By describing the content and profile of VET qualifications in terms of learning outcomes it becomes possible, for example, to look more closely at the content of qualifications, analyse them and compare them with each other and with the requirements of the labour market. The sole focus on learning outcomes imposes a restriction on the analysis and international comparison of qualification as does the fact that words can mean different things in different contexts and that shifts in meaning are also possible in translations. Nevertheless, a reference point (based on learning outcomes or including descriptors to which learning outcomes contained in qualifications can be mapped) can help support the analysis of the content of qualifications and serve as translation hub between VET qualifications (particularly those described in terms of learning outcomes) as well as between the supply and the demand side in different usage contexts.

The study has also shown that reference points, including a set of skills that is appropriate for the respective purpose for the mapping and comparison of qualifications, is essential. However, the quality of the outcomes of mapping to a reference point depends on the type and quality of the reference point,

⁽²⁶⁾ The EU-funded project Advancing graduate tracking and alumni relations in VET schools, TRACKTION, focuses on strengthening graduate tracking capacity and fostering alumni relations in VET institutions. The guide developed in this project (TRACKTION partnership, 2020) showcases a range of different approaches and good practice examples to inspire and support practitioners, institutions and policy-makers across Europe in developing or further strengthening alumni culture in VET schools.

and on the quality of the descriptions of the entity mapped to it. The way learning outcomes are described and at what degree of detail, and how differently the qualifications to be compared are structured and described in each case are also important. For example, for mapping VET qualifications to an occupational skills profile, the comparison works best when there are well-structured concepts or learning outcomes descriptions in both the reference point and the qualifications descriptions. The study clearly showed the need for further developments on both sides.

The study identified and piloted interesting development paths but also pointed to limitations in using digital technologies to support automated gathering, structuring and analysing data on qualifications, and to support comparing qualifications. Identifying such barriers provides insights into what aspects need to be further developed and points to possible directions for further action, particularly related to the presentation of data on qualifications in the European context and to reference points or systems.

Even with these limitations, analysis and comparison of the contents of VET qualifications (intended learning outcomes) can reveal interesting results in terms of their similarities and differences. The part of the project that focused on the intended learning outcomes of VET systems is important, but further insights can be provided when complemented by exploring the achieved outcomes experienced by employers and labour market stakeholders. This means comparing the intended learning outcomes with the achieved and realised learning outcomes from the perspective of the VET provider, the graduate and the employer.

The methodology explored provides the basis for understanding how these intentions relate to the labour market and society. It has the potential to contribute to a better understanding of the link between the demand for skills and their supply and clearly indicates that the comparison should not be seen as a purely abstract or academic exercise. It can serve various purposes of interest to VET policy-makers, VET providers and other stakeholders and can meet the needs of different stakeholders with their specific interests. Chapter 3 discusses different purposes and introduces a number of potential applications (use cases) linked to the methodologies developed and tested within this study.

CHAPTER 3

Potential applications and use cases

3.1. Introduction

Although the overall title of this project refers to the comparison of VET qualifications, the comparative element might not necessarily be considered as the central aspect. The information obtained by analysing qualifications and mapping their learning outcomes on a reference point also provides the basis for other processes that require a deeper understanding of the content of qualifications.

It is necessary to clarify the specific objectives, purposes and needs of the potential groups using the results of the analysis and comparison of VET qualifications, since this is important for the selection of the respective methodological approach. They determine, for example, the reference points or systems and the sources used, as well as the level of detail required and the type of tool that can be applied. For stakeholders to perceive added value of applying the methodologies and tools explored, information overload should be avoided; for most applications, there is probably a need for a light, practical and flexible approach. In many contexts, some intermediate level of information will be needed, as well as some sort of structured instrument. For example, for 'importing foreign labour', an overview of an individual's qualifications and competences will be important (short and simple learning outcomes descriptions are needed, such as through an enhanced Europass certificate supplement). Clear and standardised information is needed to match the labour market needs with the learning outcomes that people bring with them. For recognition purposes in the education context, a higher level of detail might be needed in some cases; sometimes there is a need to go into the subject matter, while in other cases short descriptions are sufficient. In recruitment situations, less detailed comparison is usually needed. For employers, comparison can give valuable information but they will almost always prefer something short and succinct that does not need to be very detailed, as long as the description gives them a solid and credible overview; other aspects play a role as well for recruitment decisions. The

results obtained, including the way they are presented (the depth or level of detail) and what is considered as ‘meaningful’ result, must meet different requirements.

It is also important to consider the limitations of the tools and methods used, since one tool cannot possibly fulfil all different purposes: attempting to cover all aspects (of all envisioned purposes) would result in an overly complex system, or information overload. Even though the analysis and comparison of qualifications can serve many purposes, it is not feasible to include them all into one tool or approach. However, the analysis and comparison, although probably always with limitations, can in most cases at least serve as a starting point for further steps.

In the context of this study, the following broad purposes, which can be supported by the analysis and comparison of VET qualifications, their profile and content, were identified.

- (a) Supporting quality, relevance and excellence of VET qualifications: the comparison of VET qualifications based on intended learning outcomes allows national policy-makers and stakeholders to judge systematically their own priorities and solutions and to gain inspirations from other countries’ choices for revising or further developing, improving (quality and excellence) and updating their own qualifications and the learning outcomes included. Reflection on the results can support mutual learning between countries and can be used as a starting point for improving and further developing VET qualifications with a view to enhancing their quality, relevance and excellence.

Comparisons of the profile and content of qualifications (in terms of learning outcomes) across countries could be complemented by an analysis of how the intentions of the education and training system (intended learning outcomes as included in qualifications descriptions) match the expectations and needs of employees and employers in a given context, and to what extent they are satisfied with what they get (acquired learning outcomes as applied in the work context). How the learning outcomes acquired by the holders of qualifications are perceived in the labour market, and particularly by their employers, provides crucial feedback related to the relevance of qualifications and the match (or mismatch) between VET provision and demand. This type of feedback can help to better shape the specific profile of qualifications and therefore to provide important information for qualifications authorities and for providers offering these qualifications to increase their labour market

relevance ⁽²⁷⁾.

- (b) Supporting the transferability of learning outcomes and flexible learning pathways in the national and international context: international cooperation for increasing mobility and recognition of qualifications can be considered at several levels and from various angles. At policy level, comparison of qualifications can be used as a means of quality assurance and improving mutual trust. For example, in the EQF context, comparing qualifications can be used to explore the consistency of levelling decisions ('horizontal comparison', see IBE, 2016) or just to visualise the similarities and differences of these qualifications.

The comparison of qualifications across countries can support the identification of learning outcomes to be addressed in mobility phases or in joint programmes and can support sectoral initiatives, such as the [Blueprint for sectoral cooperation on skills](#). Also, in the national context the comparison of qualifications can help to identify common learning outcomes and facilitate transfer of learning outcomes and progression in learning. Thus, it can contribute to enhancing the flexibility of learning pathways.

Comparison of qualifications could support employers in the recruitment of mobile workers from abroad or individuals applying for a job or a further learning programme in another country with a VET qualification, or for obtaining a VET qualification based on work experience and non-formal learning in another country. The information on similarities and differences of qualifications can also be useful for career guidance professionals or public employment services. The information gained can, for example be used to support migrants, such as identifying training needs and potential career pathways.

However, any methodology or instrument supporting the comparison of qualifications in this context can currently only support transfer and recognition processes, but the results do not automatically lead to a right of transfer or recognition of learning outcomes for individuals.

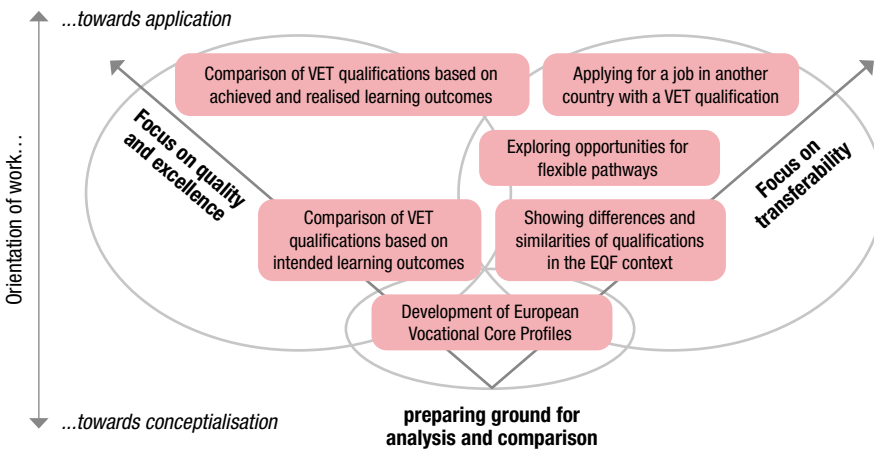
- (c) Supporting the development of European vocational core profiles: the comparison of VET qualifications could help identify the similarities of qualifications and their learning outcomes, indicating a certain core profile. European vocational core profiles' are promoted as part of the Coun-

⁽²⁷⁾ The methods studied in this project focus on the relevance of VET qualifications to labour market needs. However, VET qualifications must also be equally relevant to social or other needs of the individual.

cil Recommendation on vocational education and training for sustainable competitiveness, social fairness and resilience. The European Commission intends to support ‘the goal of gradually establishing and developing European Platforms of Centres of Vocational Excellence and exploring European Vocational Core Profiles together with Member States and relevant stakeholders, as part of the Europass platform and complemented, where possible, by vocational digital content developed in the framework of European transparency tools, with a view to facilitating mobility of learners and workers and the transparency and recognition of qualifications’ (Council of the European Union, 2020, p. 9).

Figure 10 situates the potential use cases within the analytical framework as presented in Chapter 2.

Figure 10. **Potential applications and use cases situated within the analytical framework**



Source: Cedefop.

The following sections present specific applications of the methodologies developed and tested, related to these broad purposes as potential use cases, and discuss options for how the analysis and comparison of qualifications can contribute to the achievement of the related objectives. The description of potential use cases refers both to the specific context and needs (for what?) and to the beneficiaries (for whom?) and the stakeholders involved carrying out the activity (by whom?). The requirements that the methodology has to fulfil in order to meet the needs of the specific context of use/purpose/

user are described and a possible approach is suggested, using examples from the research activities and test exercises carried out in this study. Considerations of limitations and necessary steps for improvement are also included.

It is important to stress that these potential use cases should be seen as conceptual considerations that can inspire relevant stakeholders in further developments. It is not possible at this stage to provide ready-made tools and solutions, not least because ESCO, the reference system used to support the analysis and comparison of VET qualifications in many of the use cases, and the related technical solutions are still in progress. It is also worth mentioning here – to avoid reference to it when describing each use case – that the general caveats and limitations related to the comparison of qualifications based on the mapping of learning outcomes to reference points, and conceptual considerations related to the learning outcomes approach, detailed in the previous sections, need to be taken into account in any future developments.

3.2. Supporting VET qualification quality, relevance and excellence

3.2.1. Introduction

This section will present the following potential use cases.

- (a) Improving the content and structure of VET qualifications: the analysis and comparison of VET qualifications based on intended learning outcomes allows national policy-makers and stakeholders to judge systematically their own priorities and solutions and to gain inspirations from other countries' choices for revising or further developing their own qualifications. For example, they could see how to improve the description of certain types of learning outcomes, or how to ensure the consistency of descriptions. The reflection on the results of the comparison can support mutual learning between countries and can be used as a starting point for improving and further developing qualifications.
- (b) Improving the relevance of VET qualifications: analyses and comparisons of the content of qualifications (in terms of learning outcomes) across countries could be complemented by an analysis of how the intentions of the education and training system (intended learning outcomes as included in qualifications descriptions) match the expectations and needs

of employees and employers in a given context, and to what extent they are satisfied with what they get (acquired learning outcomes as applied or realised in the work context). How the learning outcomes acquired by the holders of qualifications are perceived in the labour market, and particularly by their employers (employer satisfaction survey), provides crucial feedback related to the relevance of qualifications for the labour market and the match (or mismatch) between VET provision and demand. This type of feedback can help better shape the specific profile of qualifications and provide important information for qualifications authorities and for providers offering these qualifications. This especially refers to the delivery of qualifications: the local/provider level could use these insights.

3.2.2. Use case: improving the content and structure of VET qualifications

3.2.2.1. Purpose and relevance

VET qualifications are designed to serve the national context and there are also variations within countries (e.g. because of regional structures, such as in Spain, or of different subsystems of VET, such as in Austria). Even if qualifications from different countries and subsystems refer to the same occupation, they usually include different elements; qualifications with similar titles from different countries can have quite different contents. However, while VET qualifications will always have to respond to national, regional and local needs, their relevance and quality increasingly depend on their ability to respond to international developments and requirements, imposed by global markets and rapidly developing and changing technologies. National VET qualifications are not developed in a national vacuum but respond to skills and competence needs shared across national and institutional borders. How this balancing of local, national and international needs and requirements is carried out in practice varies across countries. Countries also organise the interaction between their education and training and labour markets in different ways, meaning that qualifications are reviewed and renewed in different ways. The analysis and comparison of VET qualifications and their content (the intended learning outcomes), which helps to identify differences and similarities, allows national policy-makers and stakeholders to evaluate their own priorities and solutions and to draw inspiration from other countries. For example, they can learn from other countries how they include transversal

learning outcomes in their VET qualifications or which types of learning outcomes are represented in a qualification. The analysis and comparison of VET qualifications can support mutual learning across European countries. Another application could be in development aid projects to help the countries concerned develop or improve their VET qualifications.

3.2.2.2. *Using ESCO occupational profiles for cross-country comparison of qualifications*

Requirements that the methodology must fulfil in order to meet the needs of this context of use

Cross-country comparison of qualifications in this context means mapping of national VET qualifications – their intended learning outcomes – to selected reference points in order to identify similarities and differences in their content and profile and to use the results for drawing conclusions for the renewal of the qualifications. A reference point or system is needed that meets the following necessary requirements:

- (a) be available in all languages used in the Member States to describe VET qualifications;
- (b) be as comprehensive as possible and cover the learning outcomes contained in the VET qualifications in all Member States;
- (c) be structured in a way that supports the mapping of national qualifications;
- (d) be based on a robust methodology for development and review;
- (e) be generally recognised in all Member States;
- (f) enable the use of digital tools to support comparison.

Introduction to the methodology

While not meeting all these requirements perfectly, ESCO is well placed to be used for the cross-country comparison of qualifications. This relevance mainly relies on the great coverage of ESCO in terms of concepts, sectors and languages, the reference to labour markets in EU countries and the public commitment to its long-term development. The latter is evidenced by continuing revision of the skills pillar structure. The use of digital technologies to support comparing qualifications has been piloted and a tool for linking learning outcomes of qualifications with the concepts of the ESCO skills pillar has been developed.

In order to compare VET qualifications from different countries that refer to the same occupational profile, the relevant occupational profile in ESCO needs to be identified: every occupation in the ESCO occupational

pillar has a profile. The occupational profiles include an explanation of the occupation in the form of a description, scope note and definition. They also list the knowledge, skills and competence concepts (KSC, included in the skills pillar), which experts consider relevant terminology for this profession at European level. When the relevant ESCO occupational profile has been identified, the learning outcomes of national qualifications can be mapped to the concepts included in the profile. This can be done either 'manually' (as presented in the box in Section 2.2.3) or supported by the learning outcomes linking tool (as presented in the box in Section 2.4.3).

Approach example

The result of the mapping process can be illustrated in a table. Table A1 in Annex 2 presents the outcome of the mapping of health care assistant qualifications from 10 countries to the respective ESCO occupational profile⁽²⁸⁾: the shaded fields indicate that the respective concept is either explicitly or implicitly covered in a national VET qualification. The volume of additional learning outcomes covered in a VET qualification, but not in the reference point, can also be indicated in the comparison table (assessed as 'none', 'low', 'medium' or 'high').

The overview offered by this table provides a direct and detailed analysis and comparison of the intentions of national qualification. It makes the content of the qualifications transparent as it explicitly visualises the choices made in terms of the content and profile of a qualification and shows the similarities and differences between qualifications. It shows, for example, that the essential skills concept 'use e-health and mobile health technology' is only included in half of the national qualifications analysed and that only the Finnish qualification includes learning outcomes related to 'communicate in foreign languages with health service providers' and 'employ foreign languages for health-related research'.

This offers a range of opportunities. The results of the comparison can initiate a reflection on whether significant differences in intended learning outcomes contained in qualifications are the result of different national approaches and requirements, or whether not including specific learning outcomes is simply due to lack of information and oversight. This comparison could be fed into discussions with national stakeholders responsible for the

⁽²⁸⁾ The mapping was carried out in the first part of the study; the content of the qualifications might have changed since then, so the results should be used with caution and be considered only as illustration of the approach.

review and renewal of qualifications to inspire development. This approach could, for example, be most applicable to companies operating in global markets where countries will want to make sure their qualifications are 'competitive'.

Limitations and necessary/potential steps/improvements

The opportunities and challenges in this context largely depend on the following aspects:

- (a) a well-developed and maintained reference point: ESCO needs to be further developed to be used as an ideal reference point in this context;
- (b) transparent and well-structured qualification descriptions: the mapping exercise benefits from data sources of qualifications that are accessible and provide a structured description of their content in terms of learning outcomes. While substantial progress has been made during recent years, descriptions of qualifications still need to be improved in many cases;
- (c) digital support: a fully automated comparison of qualifications is currently not possible. However, since doing the mapping manually is quite resource-intensive, the further development of solutions for the digital support of qualifications comparison is important.

3.2.3. Use case: Improving the relevance of VET qualifications

3.2.3.1. Purpose and relevance

It should be noted that this potential use case also starts from the analysis of qualifications but, unlike the use above case, focuses on the comparison between intended and achieved and realised learning outcomes. This is primarily an 'intra-qualification' comparison. However, the methodology presented here also includes cross-national comparison.

A feedback loop that is based on learning outcomes helps to get deeper insights into what is required on the labour market, and what is offered in training provisions and assessed at the end of a learning programme. It can also provide insights into how the learning outcomes acquired by qualification holders are perceived in the labour market, particularly by employers. This type of feedback, also from a comparative perspective, can help to shape the specific profile of qualifications and provide important information for qualifications authorities and for providers. The use of learning outcomes is crucial in this approach as it not only allows to identify (new) skills needs in

the labour market, but also to reflect on the learning outcomes acquired with a specific qualification as they are realised in the workplace. The feedback loop requires continuous dialogue on intended and acquired learning outcomes, trying to improve the stated expectations on the basis of those acquired and applied on the labour market.

While the demand side of the labour market is covered by various methods (e.g. online job vacancy analyses), there are few sources that refer to whether VET qualifications and programmes really deliver the intended learning outcomes. One approach that is not systematically implemented in European Member States but might have the potential to provide the reflection on individual learning outcomes is the employer reflection survey that takes into account the content of qualifications. These surveys are aimed at employers to measure their satisfaction with VET graduates working in their company in terms of the skills and competences acquired and their use in the workplace. Such surveys ask employers whether graduates can actually apply the skills and competences ‘promised’ in their qualification and whether graduates have the skills to meet the requirements of the job.

However, employer reflection surveys that look at the content of qualifications are only used in a few countries ⁽²⁹⁾. In some, this was due to the absence of any surveys addressed to employers; where employers were addressed, the type of survey generally tended to focus on identifying skill needs rather than on gaining insights into their satisfaction with learning outcomes achieved by their employees. Examples of six European and one non-European ERS that could be used for inspiration are presented in Box 5 ⁽³⁰⁾.

⁽²⁹⁾ In the third part of this study, the research conducted in the 10 countries only identified a few examples (Cedefop, 2021).

⁽³⁰⁾ In most of these examples the ERS is either systematically performed (IE, NL, AU) or was developed as a one-off study (AT, LT1 and 2). Spain is an exception here, in that the survey was meant to be performed every 2 years, but has not been repeated after the first iteration.

Box 5. Examples of employer reflection surveys

Austria – employer survey from the University of Applied Sciences Carinthia 2014 ⁽³¹⁾. This is a regional survey, as part of a one-off study carried out in 2014 by the University of Applied Science ⁽³²⁾.

Ireland – Irish National employer survey (NES). This (national) survey covers graduates from HE ⁽³³⁾ and further education and training (FET, the Irish equivalent of VET), and distinguishes between HE and FET in the analysis. Drivers for the NES are the national strategies for FET and HE, both of which stress the need for closer relationships between business and education and training ⁽³⁴⁾.

Spain – Employment monitor training needs in the Community of Madrid. Community of Madrid, 2016 ⁽³⁵⁾. This concerns a primary investigation of the market needs of workplaces through a survey of companies, representative in terms of economic activity and company size.

Lithuania (1, QA) – Survey on employers' satisfaction with the skills and competences of VET graduates in the framework of the project European programme of the VET quality assurance national guidance points activities No 2016-0783/001-001 ⁽³⁶⁾.

Lithuania (2, SCQ) – Survey on employers' satisfaction with the skills and competences of VET graduates executed by the Business Employers Confederation of Lithuania (LEC) in the framework of Erasmus+ mobility projects since 2016 ⁽³⁷⁾.

⁽³¹⁾ *Arbeitgeberbefragung der Fachhochschule Kärnten 2014*. Source: Fachhochschule Kärnten (2014). *Arbeitgeberbefragung 2014. Summary der Ergebnisse* [Employer survey 2014. Summary of the results]. (Not published). This survey does not refer to IVET, but to higher education. Nevertheless, it has been included in this analysis as there is no ESS for IVET in Austria and the regional approach applied was considered interesting for the design of the ESS prototype in this study.

⁽³²⁾ In preparation for the institutional evaluation (in 2015) by the Austrian Quality Assurance body for Higher Education (AQ Austria).

⁽³³⁾ Higher education in Ireland includes institutes of technology, which provide, *inter alia*, higher VET programmes.

⁽³⁴⁾ An objective of the Further education and training strategy 2014-19 is to ensure that the relevant FET provision is informed directly by employers.

⁽³⁵⁾ *Monitor Empleo. Necesidades de formación en la Comunidad de Madrid. Comunidad de Madrid, 2016*.

⁽³⁶⁾ Implemented by the Centre for Development of Qualifications and Vocational Education and Training of Lithuania: *Darbdavių pasitenkinimo profesinio mokymo įstaigų absolventų gebėjimais tyrimas, įgyvendinant 'Europos profesinio mokymo kokybės užtikrinimo nacionalinių orientacinių punktų 2016 m. veiklos programa Nr. 2016 – 0783/001-001', vykdytą Lietuvos Kvalifikacijų ir profesinio mokymo plėtros centro*.

⁽³⁷⁾ *Lietuvos verslo darbdavių konfederacijos atliekamas darbdavių pasitenkinimo profesinio mokymo įstaigų absolventų, dalyvaujančių Erasmus+ mainų programoje kompetencijomis ir kvalifikacijomis tyrimas*.

This survey was developed and used by the employers' organisation, following the needs and focused on the requirements of employers.

Netherlands – Employer satisfaction measurement: Transition of (VET) MBO – labour market ⁽³⁸⁾. This is a survey developed by SBB on request of the Ministry of Education, Culture and Science (OCW) in 2015. The survey was conducted by an organisation that already has a registry of recognised (VET) training companies. The sample was expanded for the second iteration (including unregistered 'non-training' companies).

Australia – 2018 Employer satisfaction survey (ESS). The ESS is an annual national survey involving two rounds of data collection each year (in November and May). The ESS looks at university and non-university higher education graduates. The specific targets are the supervisors of recent graduates. The ESS in Australia is a national approach, with a well-developed methodology. The downside of this ESS is that it focuses on higher education and that it is a non-European survey.

Source: Cedefop, 2021.

3.2.3.2. Methodological approach

Requirements the methodology must fulfil in order to meet the needs of this context of use

An employer reflections survey (ERS) approach that allows direct reflection on VET qualifications' content (focuses on learning outcomes) requires to have the following preconditions in place.

- (a) The starting point for ERS implementation should be with VET providers (for organisational reasons since they can reach out to graduates and their employers and because they can use this approach as part of their quality assurance arrangements); but they should also allow for comparisons beyond individual VET providers, e.g. at qualification, sectoral, national or international levels (data collections should allow aggregation of the data to sectoral, national and cross-national levels).
- (b) The ERS should be designed to include the perspective of employers, but also that of the VET provider and graduates, to ensure a comprehensive picture in terms of intended and realised learning outcomes and whether they match the skills needed in the labour market.

⁽³⁸⁾ *Meting tevredenheid werkgevers: Aansluiting MBO – arbeidsmarkt.*

- (c) VET providers should be able to reach out to graduates and employers of recent graduates; this requires the VET providers to have a functioning alumni-policy and an idea where graduates work after their studies.
- (d) The ERS should have questionnaires with lists of skills (reference point) that are detailed enough to allow in-depth reflections on the content of the qualifications but are short enough to be used in a survey without burdening the respondents with tiresome lists of skills. This will give a good balance between complexity and simplicity of the reference point used.
- (e) The reference point used for the ERS should have an appropriate balance of transversal and occupational skills.
- (f) The anonymity of respondents should be respected: assessments of learning outcomes must not be traceable to individual graduates and employers. This requires sufficient responses for VET provider and qualification profile, though the full population of learners obtaining a specific qualification and graduates that enter a qualification-related job is often quite small.
- (g) the ERS should not be considered as an accountability tool but rather a tool to initiate dialogue between VET providers and employers (and graduates) as part of the quality assurance measures at provider level. This approach can support VET providers to match their offers better to the needs of their direct labour market stakeholder, as it provides them a possibility to engage with their beneficiaries (graduates and employers) and reflect together with them on the outcomes of the VET programme offered as well as on the regional labour market.

Introduction of the methodology/tool

Questionnaires for reflecting on intended and acquired learning outcomes

The core part of the questionnaire is the skills typology (reference point; see Table A2 in Annex 2) that will be reflected upon by the respondents (see Section 2.5). The prototype of the ERS developed in this study comprises three online questionnaires (see tables A3, A4 and A5 in Annex 2):

- (a) questionnaire for VET providers;
- (b) questionnaire for VET graduates;
- (c) questionnaire for employers.

Workflow of the ERS

The following workflow for implementing the ERS is suggested.

- (a) Step 1: the VET provider provides a characterisation of the VET qualification in terms of a learning outcomes profile in relation to the reference point for the VET qualification (questionnaire for VET provider).
- (b) Step 2: the VET provider sends a link to the questionnaire to the graduates (questionnaire for graduates). In the invitation-email, the researchers outside the VET provider who will be analysing the data are also introduced. Although the VET provider is responsible for inviting the graduates, the individual data gathered will not be available to them (they will not be able to trace the answers back to the individual respondents).
- (c) Step 3: the VET provider compiles a list of employers that potentially hired graduates from the programme and send the invitation-link to participate in the survey to the employers (questionnaire for employers). This survey also includes questions on whether the employer consents to being contacted by the researchers to discuss the aggregated results.
- (d) Step 4: the researchers analyse the survey results and discuss the outcomes with the VET providers and employers to initiate dialogue on intended and achieved learning outcomes and the content of the VET qualification.

Approach example

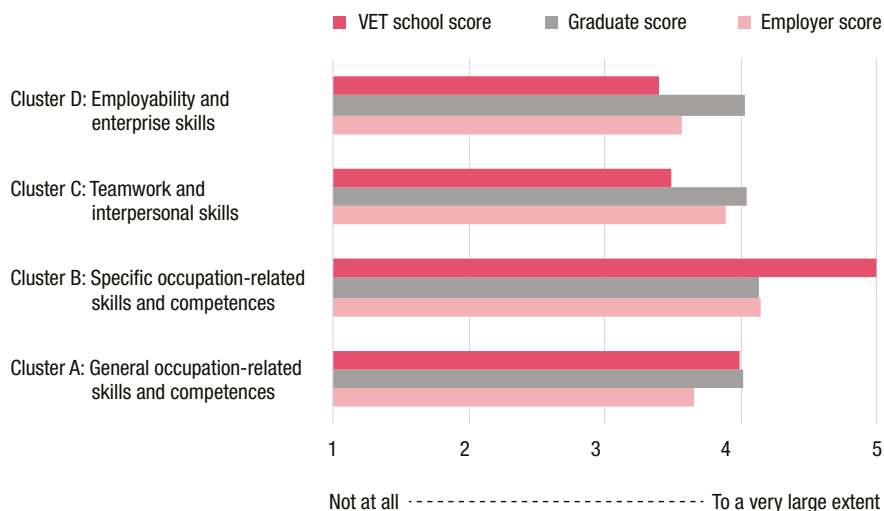
The pre-test was conducted in the ROC van Tilburg school for care and well-being (*School voor Zorg en Welzijn*) and focused on the healthcare assistant qualification at EQF level 3 (*Verzorgende, IG*). The VET provider facilitated the distribution among graduates of the last 2 years (2018/19 and 2019/20) and approached a group of employers that regularly hire graduates (or that continually have apprentices and interns from the VET provider). This resulted in 12 employer responses and seven full responses from graduates. As around 20 employers and around 75 graduates were invited; the response rate among employers (60%) is higher than that of graduates (9%). Many graduates, however, were excluded as they continued studying, or as they were not in a job or a job related to the qualification. The employers range from organisations with 150 employees to those with 5 000 employees. They all have a regional focus, providing healthcare services. All employers indicate that the qualification is a formal requirement for entering the job.

While the small number of responses cannot justify representativeness, as a general overall assessment, employers and graduates are positive concerning whether the VET programme prepared the graduate for his or

her job: 83% of the employers and 86% of the graduates indicated that the programme prepared the graduate ‘well’; 17% of the employers and 14% of the graduates even assessed the preparation as ‘very well’. 58% of the employers considered it very likely that, based on the experience with the graduate they were reflecting on, they would consider hiring another graduate of this VET programme.

A more detailed question related to whether graduates have acquired the expected skills, and hence to what extent the respondents believe that the VET programme has provided the graduates with the skills for effectively working in a company/organisation. This question was asked of the VET provider (one respondent), the graduates themselves (seven respondents) and the employers (12 respondents). The first figure shows the average score per cluster of skills.

Figure 11. Clusters of skills provided by the VET programme (NL)



Source: Pre-test employer reflection survey [N=20] (Cedefop, 2021).

This cluster overview shows that employers and graduates are most positive about seeing specific occupation-related skills and competences and that this is also recognised by the VET provider. Employers are of the opinion that employability and enterprise skills are the least in evidence. Compared to the VET provider, employers and graduates are generally more positive on employability and enterprise skills, such as meeting deadlines

and persistence and endurance. This might not be a core competence offered by the VET programme, but in the labour market these skills are well-recognised. More data-related learning outcomes (manage data, work with numbers) are assessed as being less present compared to VET provider assumptions. Besides asking whether the graduates actually have obtained the skills, the pre-test survey also asked which learning outcomes are considered most and least important.

There is an overall high level of satisfaction among employers and graduates concerning the learning outcomes provided by the VET provider, but there are learning outcomes that need further reflection and discussion between the three parties in terms of whether they are acquired sufficiently during the programme and/or related to their importance. Examples of learning outcomes that deserve a discussion include B10: Manage healthcare users' data, and D2: Reflect work processes and procedures. VET providers have a more positive view on whether graduates obtained these learning outcomes compared to employers and graduates. Ability to work under pressure (D1) is considered a priority by graduates and is assessed as being acquired, but the VET provider is more negative about whether graduates obtained this learning outcome. Apparently, graduates feel that they have obtained more learning outcomes than the VET provider can oversee.

Limitations and necessary/potential steps/improvements

First, organisational issues need to be considered: VET providers need resources and capacity to administer the survey and could probably not use this approach *en masse* for all qualifications they offer during a single year. They also need to be consulted on the survey and probably need some additional support or extra staff. Implementing employer reflection surveys requires VET providers to have a functioning alumni-policy in which contact details of graduates are kept up to date and that also assures that graduates provide consent in being approached for surveys after obtaining their VET qualification. VET providers also need to have a good overview of the companies or institutions where graduates start work. The time investment from the VET providers' side in launching the surveys is significantly reduced when there is a functioning alumni policy⁽³⁹⁾ and overview of companies that take in graduates.

Of key importance is a suitable list of skills (reference point) to allow in-

⁽³⁹⁾ For guidelines in this regard see e.g. TRACKTION partnership, 2020.

depth reflections on the content of the qualifications; at the same time, it must be short enough to be used in a survey without burdening the respondents with tiresome lists of skills. A good balance between complexity and simplicity is necessary. In order to be able to include a cross-country comparison in this approach, it is also necessary that the reference point is relevant to, and can be agreed upon by, all stakeholders and countries involved. More work is needed to address conceptual challenges of this survey approach.

3.3. Transferability of learning outcomes and flexible learning pathways: national and international context

3.3.1. Introduction

The first potential use cases presented in this section relate to the national (such as qualifications authorities) and institutional (such as VET providers) levels, while the other use cases focus on the individual level (such as learners, employees or jobseekers as well as employers). The latter group of beneficiaries will most likely need the support of career guidance professionals for analysing and comparing qualifications: without this support, it is difficult to imagine how the potential applications could actually be used in practice.

National and institutional levels

- (a) Supporting the levelling of VET qualifications: comparing VET qualifications can help to identify the levels of qualifications and to understand better the allocation decisions. It is necessary to gain a deeper insight into the content of the qualifications for this.
- (b) Supporting mobility in VET: comparing training programmes and understanding qualifications from other countries' systems and their learning outcomes is one of the main challenges in implementing transnational mobility and the recognition of competences acquired abroad. Comparison can help identify learning outcomes that can be addressed in mobility phases.

Individual level

- (a) Exploring opportunities for flexible learning pathways: comparing VET qualifications can help to show opportunities for individual and flexible learning pathways within the national context as well as at the international level.
- (b) Applying for a job in another country with a VET qualification: comparing VET qualifications can help to decide whether it is worth applying for a job in another country and can provide insights into what additional learning outcomes would be required. Comparison of qualifications could also support employers in recruiting mobile workers with a VET qualification from abroad.

3.3.2. Use case: supporting the levelling of VET qualifications

3.3.2.1. Purpose and relevance: consistency of levelling decisions

The EQF aims to contribute to a better understanding of different qualification systems and to aid the transparency and comparability of qualifications and their portability and transfer across countries, systems, sectors and learning contexts. Through the EQF referencing process, national authorities responsible for qualifications systems, in cooperation with stakeholders responsible for developing and using qualifications, define the correspondence between the levels of their national qualifications system, usually in terms of a national qualifications framework, and the eight levels of the EQF. The EQF aims to provide a comprehensive map of all types and levels of qualifications in Europe, which are increasingly accessible through qualification databases and, thus, to serve as a translation tool. However, when looking at qualifications linked to the same EQF level, it is not always clear at first sight why this is the case, as the qualifications themselves can be quite different in scope or specific content. Qualifications from the same occupational field and possibly with a similar title can end up at different EQF levels; to understand the allocation decisions, it is necessary to have a deeper insight into the content of the qualifications. The EQF Advisory Group has set up a project group on 'horizontal comparison' whose main purpose is to examine the consistency of levelling qualifications based on learning outcomes across countries, to achieve transparency and comparability. A pilot exercise was carried out in 2016 (IBE, 2016) and the current project group is looking into comparing ICT and social care qualifications at levels 4-6; intending to present results to the EQF Advisory Group by the end of 2020.

3.3.2.2. *Methodological approach: using a VQTS-based Competence Matrix*

Requirements the methodology must fulfil in order to meet the needs of this context of use

A reference point suitable to support the comparison of qualifications and the discussions on the consistency of levelling decisions should have at least the following characteristics: it should make it possible to distinguish between descriptions of learning outcomes that reflect different levels of proficiency, thereby making the level assignment of qualifications more transparent and easier to follow. It should make it possible to visualise the similarities and differences between the qualifications mapped on it in relation to the level in question.

Introduction to the methodology

One reference point that allows for identifying different performance levels and that can be used to compare qualifications and to check whether and how the different performance levels are expressed, is a VQTS-based competence matrix, based on the model developed in the project *Vocational qualification transfer system (VQTS)* (Luomi-Messerer, 2009).

Box 6. VQTS-based competence matrix

Competence areas (based on core work tasks) are the main structural element of a VQTS-based competence matrix. A competence matrix displays competences structurally in a table, according to core work tasks in a specific occupational field and the progress of competence development. Competence areas form the vertical axis of the table. The acquisition of competences by a person in training with reference to core work tasks is described for each competence area as steps of competence development (horizontal axis). Between two and six successive steps of the competence development process within certain core work tasks are described.

The competence matrix can be used to show similarities and differences of qualifications preparing for the same occupational field.

Source: Luomi-Messerer, 2009.

Approach example

The use of a VQTS-based competence matrix for comparing qualifications was discussed in the first part of the overall study and tested with the **Com-**

petence matrix 'professional care'. This matrix was developed in the EU project HCEU and describes the steps of competence development in the field of nursing, starting with helper professions within nursing up to bachelor level.

Table A6 in Annex 2 provides an example of the comparison between the Danish and the Irish healthcare assistant qualification (both are linked to EQF level 4) based on the mapping on the VQTS/HCEU competence matrix. The mapping shows clear differences between these qualifications, linked to the same EQF level through their inclusion in the respective NQF. The Danish qualification (shaded fields) generally includes more steps of competence development: it refers to higher performance levels than the Irish one (orange shaded fields). These differences cannot be made visible with reference points that do not reflect different levels of proficiency⁽⁴⁰⁾. Information would need to be collected on these qualifications to interpret them further.

Limitations and necessary/potential steps/improvements

VQTS-based competence matrices are available for a few occupational fields and in few languages only. They are often developed in EU-funded projects and not updated after the end of the project's lifetime.

The VQTS/HCEU competence matrix is very good in differentiating competence areas and higher and lower-level abilities. However, the differentiation of the steps of competence development makes the mapping process more time-consuming and requires deeper expertise related to these work processes. In addition, the core work task approach followed here might fit well with qualifications that use an activity-based description, while it might be less suitable for mapping qualifications that use a different structural approach.

3.3.3. Use case: supporting mobility in VET

3.3.3.1. Purpose and relevance: ensure quality of mobility in VET

The use of learning outcomes is an important element in helping ensure the quality of VET mobility, making sure that the learning achieved in another country or context can be recognised, and, if possible, that mobility-related achievements can be fully integrated into new or existing learning pathways.

⁽⁴⁰⁾ The mapping result also shows the overlapping areas of the two qualification profiles. This information could be used, for example, as a starting point for cooperation purposes, such as designing mobility phases (Section 3.3.3).

That the recognition of learning outcomes acquired abroad is likely to become more important if longer duration mobility becomes more common⁽⁴¹⁾. However, descriptions of qualifications, programmes or parts thereof, even if described in terms of learning outcomes, vary greatly and very often are not immediately comparable at first glance.

When preparing for learning mobility in VET, mobility partners will need to agree on a set of learning outcomes that can be achieved by a learner during a mobility phase this will typically be a stay abroad at another VET institution or as company internship, but potentially also as virtual mobility (wholly or partly). Mobility partners will first need to establish common understanding of the learner's current progress and agree on learning outcomes to be achieved during mobility. Mobility can focus on learning outcomes that are covered in both qualifications or programmes. Alternatively, mobility partners can also agree on a set of learning outcomes that the 'home' qualification or programme cannot offer.

Comparison using a common reference point can help identifying learning outcomes that can be addressed in mobility phases. This will be done by mapping a VET qualification, programme or parts thereof – its intended learning outcomes – to a selected reference point in order to identify similarities and differences in content and profile. This can then build the basis for deciding which parts of a qualification/programme could be the objective of a learning stay abroad.

3.3.3.2. *Methodological approach and necessary conditions to implement the use cases*

Requirements the methodology must fulfil in order to meet the needs of this context of use

For this purpose, the same general requirements apply as described above for the reference point in the use case Comparison of VET qualifications based on intended learning outcomes.

More specifically, a reference point or system that supports mobility in VET should be widely understood and recognised across countries, to help create mutual trust between mobility partners. Descriptions should be universally understandable and avoid any ambiguity. This also requires that the reference point provides a certain level of detail. Ideally, it should also

⁽⁴¹⁾ For a reflection on challenges and opportunities of long-duration mobility see, e.g. UK ECVET Expert Team, 2020.

refer to the level of performance.

Introduction to the methodology

One example of a reference point that can be used to support mobility in VET is the WorldSkills standards specifications (WSSS).

WSSS have been developed to serve as reference points for the biennial WorldSkills competition. They attempt to be a broad representation of one or more work roles, as required across the world by expansive, competitive organisations.

WSSS are well suited to the purpose: their descriptions are clear and easily understandable; they integrate both occupational and transversal skills; and descriptions are clearly oriented towards activities. WorldSkills currently has **85 member countries and regions**. The WSSS are reviewed and updated following each WorldSkills competition, which takes place every second year.

As a first step, a suitable WSSS needs to be identified. As of 2019, there were 56 WSSS in six sectors available. As of early 2021, the WSSS website offered **63 different WSSS in six sectors available for download**. The mapping can be done ‘manually’ (similarly to the ESCO mapping as presented in the box in Section 2.2.3).

Approach example

Table A7 in Annex 2 provides an exemplar comparison between the IT technician qualification of Denmark and of Austria (both are linked to EQF level 4), using the WorldSkills standards specifications as a reference point. The resulting mapping highlights both the similarities and differences between the two qualification profiles ⁽⁴²⁾.

The pink shaded fields indicate a ‘match’ between each qualification and the WSSS, and hence show where a particular learning outcome is covered by both qualifications. The overview provided by this table visualises both the similarities and differences between the two qualifications or programmes. It can help visualise the learning progress of an individual, and the learning

⁽⁴²⁾ If it is only a question of identifying learning outcomes for mobility phases between two qualifications from two countries, a reference point is not absolutely necessary. This approach could complicate the process if it were enough to compare two qualifications. However, when dealing with several countries or a more extensive or multi-year project, a reference point can be quite helpful. The approach presented here helps to solve some issues related to mobility but not all (e.g. assessment practices are not addressed here).

outcomes that a host organisation can offer. This can then build the basis for formulating the learning outcomes to be achieved by a learner (e.g. as part of their mobility learning agreement).

The mapping shows significant similarities for the three areas of configuring networking devices; installing, upgrading, and configuring operating systems; and work organisation and management. For these areas, both qualifications cover the skills items in the WSSS profile to a similar extent.

While the Austrian IT technician qualification covers more skills items in the categories related to user support and consultancy, and to communication and interpersonal skills, the Danish IT technician qualifications covers more skills items in the area of troubleshooting. The overview generated by this mapping can provide a useful basis for mobility partner exchanges on the learning outcomes to be achieved during a mobility phase. Mobility could then focus either on the 'common' learning outcomes or on learning outcomes not included in a qualification, to enable the mobile learner to acquire additional learning outcomes.

Limitations and necessary/potential steps/improvements

Reference points representing the qualification profile, i.e. the learning outcomes to be achieved at the end of the learning programme, might be of limited use for learner mobility, since, in these cases, VET learners are still in the process of competence development. A reference point that allows distinguishing between different steps of competence development, such as a VQTS-based competence matrix, might be more suitable for this purpose. Nevertheless, it might be feasible to select those learning outcomes from the profile that have already been acquired before the mobility starts, or to put additional effort into 'translating' learning outcomes that reflect the intended achievements at the end of a learning programme into 'intermediate learning outcomes'.

The WSSS are not designed to cover the full range of economic sectors or occupations or to provide for a comprehensive representation of qualifications at all levels. Their primary usage context is competitions, which are focused on high performance work practice in medium work areas; higher or lower levels are therefore excluded from this reference point from the outset. Learning outcome statements are also rather broad and leave room for interpretation which might create some ambiguity.

While the WSSS are widely known across countries, detailed information on updates or traceability of amendments of WSSS is not publicly available.

The availability of WSSS in different language versions is limited. WorldSkills International publishes them in English language only, although some members produce (unofficial) translations for their use in preparation for the competitions.

3.3.4. Use case: exploring opportunities for flexible learning pathways

3.3.4.1. Purpose and relevance: enabling learners' smooth transition across education, training and employment

When choosing a VET programme in another country, it helps to know which VET programmes cover similar learning outcomes and what opportunities there are for changing pathways at a later stage. This could support reducing dropout and facilitate career switches. If a specific VET qualification is an access requirement for a further learning programme in another country, identifying similarities and differences can help to decide whether it is worth applying and which additional learning outcomes would be required. A reference point that supports the mapping of learning outcomes contained in national qualifications and their translation into other languages can also be used for validation of prior learning (VPL). This aids the identification and documentation of a person's learning outcomes acquired through non-formal and informal learning in another country, with a view to obtaining a vocational qualification (i.e. identification of training needs to make up for missing competences or where training would unnecessarily replicate existing skills held).

The ultimate goal is to provide a tool that supports learners in making smooth transitions from one learning pathway to another. This implies that learners are given the opportunity to recognise their prior learning from various contexts in working towards achieving a new qualification. It may mean supporting learners to identify and build on skills and competences they already possess, e.g. by identifying opportunities for credit transfer or recognition of prior learning; it may also refer to improved presentation and understanding of education and training options that are available to an individual, or to a reorganisation of education offers to respond better to learners' needs.

3.3.4.2. Methodological approach and necessary conditions to implement the use case

Requirements the methodology must fulfil in order to meet the needs of this context of use

The same requirements apply as described for the reference point in the use case Improving the content and structure of VET qualifications.

Introduction to the methodology

ESCO is well placed to meet these requirements due to its broad scope and availability in many languages. In order to compare two different VET qualifications, the most suitable ESCO occupational profile needs to be identified. Each occupational profile consists of a list of knowledge, skills and competence concepts (KSC), which are structured into different categories. As a second step, the learning outcomes of two qualifications to be compared can be mapped to the profile.

The mapping can be done either ‘manually’ (as presented in the box in Section 2.2.3) or supported by the learning outcomes linking tool (as presented in the box in Section 2.4.3).

Approach example

The outcome of this mapping presents the similarities and differences between the selected qualification descriptions in relation to the ESCO profile. Table A8 in Annex 2 displays the comparison between an Irish and an Austrian IT technician qualification (both EQF level 4). The pink shaded fields indicate that a given KSC concept is covered by a qualification. Both qualifications display a similar coverage of the ESCO occupational profile. In terms of transversal skills and competences, however, the Irish qualification displays higher coverage in particular for social and communication skills, and for thinking skills and competences. For an individual seeking to acquire a certain qualification, such an overview can show which learning outcomes they need to acquire, and which learning outcomes they have already achieved through prior education and training, and/or work experience.

Limitations and necessary/potential steps/improvements

While the mapping against ESCO profiles can highlight differences and similarities between qualifications in terms of which knowledge, skills and competence concepts they cover, the ESCO profiles in most cases will not be able to capture the full scope of national qualifications: national qualifications will include additional learning outcomes that cannot be captured by one single occupational profile. Individual learners will probably require support from guidance professionals.

3.3.5. Use case: applying for a job in another country with a VET qualification

3.3.5.1. *Purpose and relevance: identifying similarities of VET qualifications required for a job abroad*

Mobility of workers between EU Member States, as well as labour migration from third countries, are important aspects in responding to rapidly changing labour market needs, skills shortages and the demographic situation in Europe. People applying for a job in another country need to know whether their qualification meets the requirements for that job (or what additional learning outcomes they would need to obtain for a proper match), and employers need to know whether the VET qualification of the applicant from abroad is comparable to a national VET qualification normally required for the specific job (and indicated in the job advertisement as desired or required). To support worker mobility, tools and procedures are needed that can aid understanding of VET qualifications acquired abroad as well as comparison with a corresponding national qualification.

3.3.5.2. *Methodological approach (incl. tools) and necessary conditions to implement the use cases*

Requirements the methodology must fulfil in order to meet the needs of this context of use

For the comparison of VET qualifications acquired abroad with national qualifications, the same requirements apply as described for the reference point in the use case Improving the content and structure of VET qualifications.

However, given that the comparison may be carried out either by the person applying for a job or by the employer assessing the application or by an intermediary organisation, the methodology needs to be simplified as much as possible. The availability of learning outcomes descriptions and the use of digital tools to support the comparison are of crucial importance.

Introduction of the methodology

ESCO is the reference system that is well-placed to be used in this context because of its scope and the available language versions but also because of the continuing developments in the technologically supported linking of learning outcomes included in qualifications to the concepts of the ESCO skills pillar.

Where the mapping results of a cross-country comparison of the

respective qualifications already exist, this could be made available at the EURES platform. EURES is the network of European employment services and provides information, advice and recruitment and placement services for workers and employers wishing to benefit from the principle of the free movement of persons. The decision on sufficient or insufficient similarity of the qualification obtained and the qualification desired or required can then be based on this mapping exercise. Identifying similarities and differences in the content of qualifications can help the individual to decide whether it is worth applying for the job (for example, if the majority of the required learning outcomes are also included in the acquired qualifications) and the to employer decide whether there is sufficient reason to invite the applicant who has applied to the next round, such as an interview.

If such a mapping result is not yet available and the comparison needs to be done by the person looking for a job abroad, by the employer looking for a new employee or by a career guidance professional, specific support tools should be made available. The IT tool based on natural language processing that was developed to support the automated linking of learning outcomes of qualifications with ESCO skills could be integrated into a dedicated page of the EURES platform. While the tool does not offer a fully automatic comparison of qualifications, the automatic suggestions of ESCO skills against the learning outcomes of selected qualifications, which can be provided in different EU languages, can help to analyse and better understand the content of the qualifications.

Approach example

The overview provided in Table A9 in Annex 2 – here for the ESCO occupational profile healthcare assistant – shows the similarities (pink shaded cells) and differences between qualifications:

The larger the number of shaded cells contained in both qualifications (with a simultaneous presence of few additional learning outcomes in both qualifications), the stronger a similarity of the qualifications can be assumed with regard to the intended learning outcomes. However, a special focus must be on the fields that remain white when mapping a qualification to the ESCO occupational profile. If, for example, the skills ‘use e-health and mobile technologies’ or ‘instruct others’ are included in the required, but not in the acquired, qualification, it is important to find out whether these skills are essential for the job offered and whether they can be acquired in further training programmes or through on-the-job learning. Individuals might need

support from career guidance professionals in this process.

Limitations and necessary/potential steps/improvements

For this usage context, generally the same limitations and improvements as for the use case on Improving the content and structure of VET qualifications can be noted. In the case of mobile workers, the acquisition of the qualification must not have taken place too long ago for this approach to make any sense. If the acquisition of the qualification was too long ago, then the qualification awarded itself most likely still plays a role in the recruitment process, but less so the associated individual learning outcomes. What counts for potential employers is the work experience gained and built upon since then and how job applicants present themselves. Guidance and professional support for mobile workers and their potential employers need to be provided in this context.

3.4. Development of European vocational core profiles

3.4.1. Introduction

The creation of European vocational core profiles is called for in the 2020 VET Recommendation (European Commission, 2020e) and is linked both to the development and enhancement of excellence of VET qualifications and to the recognition of learning outcomes.

The concept, however, is not new. A 1992 report prepared for Cedefop on the comparability of VET qualifications in Europe suggested exploring European-wide modules ‘to facilitate both personal career planning (in that comparable modules for different occupations could be combined) and a flexible response to trends and changes in national and Community labour markets’ (Koelink, 1991, p. 31). In 2000, France proposed the development of common certificates with a European vocational standard. A pilot project in the logistics and hotel management sectors was funded by the European Commission, in cooperation with some Member States and Cedefop, and proposed a ‘common architecture for diplomas/certificates/qualifications’ divided into two parts: the first as a common part for all partner countries (containing a professional profile and describing professional competences) and the second as a specific part for each partner (e.g. national regulations related to access, organisation of teaching, etc.) (Rudowski and Asseraf,

2008). Some experience from this pilot initiative was incorporated into the Copenhagen process launched in 2002 and the development of both the EQF and ECVET. Although many subsequent projects explored ways to compare qualifications and facilitate mobility through commonalities in qualifications, the development of European vocational core profiles was not an explicit target. However, some initiatives at European level of 2015/16 explicitly referred to common core profiles; the Study on the feasibility of setting institutional arrangements at European level to ensure management and quality assurance of issues related to an extended scope of the European Qualifications Framework (EQF)' (PPMI and 3s, 2016); a call for proposals referred to supporting *de facto* recognition of qualifications from European core profiles of qualifications⁽⁴³⁾; and the project Transparency in arts levels and qualifications (TALQ, 2017). The 15th meeting of the ECVET user group in February 2016 discussed common core profiles, finding that, 'there are some experiences from ECVET projects that have developed competence matrices or occupational/professional profiles as part of the process of comparing qualifications'⁽⁴⁴⁾. However, participants considered the purpose and value of common core profiles unclear.

It seems that the progress made during recent years has at least contributed to the new attempt of developing common core profiles. Examples include the learning outcomes approach, the implementation of the EQF and of NQFs referenced to it, ESCO, the Europass platform, digital tools for supporting the analysis of learning outcomes and for identifying rapidly changing skills needs, as well as related to initiatives such as the Blueprint for sectoral cooperation on skills or the common training frameworks (CTF) or common training tests set up in the context of the [Professional qualifications directive](#).

3.4.2. Use case: supporting the development of European vocational core profiles

3.4.2.1. Purpose and relevance: identifying common learning outcomes

The proposal for the Council Recommendation on VET (European Commission, 2020e) introduces the concept of European vocational core profiles,

⁽⁴³⁾ Erasmus+ – Sub-action Key Activity 3 – Support for policy reform initiatives for policy innovations – Quality assurance at European level for enhanced transparency and recognition of skills and qualifications – call EACEA 48/2015. See the [administrative procedures for the call for proposals](#) and the [funding opportunities by programming period](#).

⁽⁴⁴⁾ Summary report of the 15th meeting of the ECVET user group – Brussels, 25 February 2016.

which would define a certain share of common training content at European level and should support transparency and recognition. This is further specified in the tender specifications for the Support services related to quality assurance (EQAVET), graduate tracking and flexibility in vocational education and training (ECVET) (European Commission, 2020f, p. 10) ⁽⁴⁵⁾: ‘The core profiles should be a common European reference tool as the latest skills needs emerging in the European labour market identified primarily by vacancy analysis.’ These core profiles should be part of the Europass platform and complemented, where possible, by vocational digital content. They would reflect the dynamism of skills requirements in the labour market and aligned VET content, making them an innovative support for VET mobility and excellence.

Although there may be some reluctance on the part of some national stakeholders to adopt these core profiles (fearing a move towards harmonisation), this approach could be particularly relevant in economic sectors characterised by a high degree of internationalisation or transnational mobility. They could also be useful for countries that want to revise their VET qualifications or develop new ones.

The concept of the European vocational core profiles (that is currently being elaborated) aims at defining a minimum set of learning outcomes to be common across Member States. Methods are needed to support the identification of such common learning outcomes to develop the profiles based on existing VET qualifications ⁽⁴⁶⁾.

⁽⁴⁵⁾ This support service includes the development of a concept for European vocational core profiles, including an assessment of operational and technical feasibility.

⁽⁴⁶⁾ Another option could be to develop them on the basis of emerging skills needs, where the common part could then be incorporated into national qualifications or new qualifications could be created.

3.4.2.2. *Using ESCO occupational profiles for identifying common learning outcomes*

Requirements the methodology must fulfil in order to meet the needs of this context of use

The reference point to be used in this context should ideally:

- (a) be available in all languages used in the Member States to describe VET qualifications;
- (b) be as comprehensive as possible and cover the learning outcomes contained in the VET qualifications in all Member States;
- (c) be structured in a way that supports the mapping of national qualifications;
- (d) be based on a robust methodology for development and review;
- (e) be generally recognised in all Member States;
- (f) enable the use of digital tools to support comparison.

Introduction of the methodology

ESCO is well placed to meet these requirements as every occupation in the ESCO occupational pillar has a profile. These profiles include an explanation of the occupation in the form of a description, scope note and definition. They also list the knowledge, skills and competence concepts (KSC, included in the skills pillar), which experts consider relevant terminology for this profession at European level. ESCO has a wide coverage of sectors and languages, relates to labour markets in EU countries and, although there are shortcomings related to its quality, the European Commission is continuously working to improve it. For example, the ESCO skills pillar has been, and is being further, developed by introducing classifications for the occupational and the transversal skills concepts. The use of digital technologies to support the comparing of qualifications has been piloted and a tool for linking learning outcomes of qualifications with the concepts of the ESCO skills pillar has been developed. The common concepts can either be identified 'manually' (see mapping approach presented in the box in Section 2.2.3) or supported by the learning outcomes linking tool (as presented in the box in Section 2.4.3).

Approach example

Table A10 in Annex 2 shows the set of KSC items resulting from the mapping against the ESCO occupational profile healthcare assistant. It includes those KSC concepts that are covered (either explicitly or implicitly) in at least nine out of the 10 qualifications that were mapped to the profile in the first part of

the study. This set of KSC items might thus be considered as a set of core learning outcomes across the 10 qualifications covered.

Limitations and necessary/potential steps/improvements

The notion of ‘core learning outcomes’ needs to be used with caution here since the result of the mapping exercise only reveals the lowest common denominator; it says nothing about the relative importance of these skills in the respective qualifications. It is also quite possible that learning outcomes that are of particularly high importance in the context of a qualification are not included in these core learning outcomes. In this case, the core profile created in this way would be of little relevance in the country concerned. The approach described above can only be a first step towards developing a core profile, which will need to be continued through further discussion or negotiation processes with relevant stakeholders.

To address rapidly changing skills needs, the European vocational core profiles will need to be regularly updated, as will the reference point used and the ESCO occupational profiles, to consider and reflect new developments. Appropriate mechanisms and structures need to be in place and relevant sources are required to inform about emerging skills needs. Cedefop’s Skills-OVATE: [online vacancy analysis tool for Europe](#) ⁽⁴⁷⁾ could be used for this. It offers detailed information on jobs and skills employers demand in online job advertisements. Since it also uses ESCO terminology, it could contribute to the identification of the latest skills needs to be included in the profiles.

In addition to the lack of a fully automated approach for comparing qualifications, there are also problems of access to national data on qualifications and a lack of common technical formats for presenting qualifications and their learning outcomes. Improvements from both sides – IT solutions and national qualifications – are necessary.

⁽⁴⁷⁾ For challenges analysing this type of data see, for example, JANZZ.technology, 2021.

CHAPTER 4

Conclusions and recommendations

4.1. Conclusions

The synthesis of the three research phases, the further reflections on the approaches developed and tested, as well as on relevant further developments (stock-taking), and the development of potential use cases for applying methodologies for analysing and comparing VET qualifications lead to the following conclusions. These conclusions are structured according to the three research questions underlying this report.

4.1.1. Conclusions related to research question 1

How can methodologies for analysing and comparing qualifications support European cooperation in VET and support national stakeholders in strengthening quality and relevance of VET qualifications?

Conclusion 1

The use of learning outcomes in describing the content and profile of VET qualifications opens up opportunities for applying methodologies for analysing and comparing qualifications that contribute to improving the relevance of VET qualifications and supporting their transferability.

The study showed that VET qualifications described in terms of learning outcomes can be analysed and compared across profiles, sectors and countries, and that analyses and comparisons can even be conducted on the intended and acquired learning outcomes. Learning outcomes are central to this as they allow for a breakdown of qualifications that can be systematically applied and analysed in different (national VET) contexts; learning outcomes descriptions also allow for the analysis and better understanding of the content of qualifications, their orientations in relation to labour market access or further learning.

The comparative approaches that use learning outcomes as a basis allow reflection on the content and orientations of VET qualifications in different contexts and offer insights that can be used to improve the relevance of VET qualifications. Learning-outcomes-based methodologies for analysing and comparing VET qualifications allow multiple stakeholders to increase their engagement in reviewing and renewing VET qualifications, and allow for using the outcomes of this exercise in other processes such as (career) guidance to VET students/graduates, supporting transnational mobility of qualifications and labour mobility.

Conclusion 2

A methodology for analysing and comparing qualifications based on learning outcomes can be supported by the use of a reference point that includes a set of skills appropriate to the analysis and comparison of qualifications.

As the content of VET qualifications is constantly changing under the influence of labour market, technological, pedagogical, societal and political developments, there is no fixed point at which the content of VET qualifications can be compared to this yardstick. However, methodologies for analysing and comparing the content of VET qualifications benefit from an agreed reference point to allow for the mapping and comparison of qualifications in different contexts. Such a reference point is only a ‘translation device’ and a methodological tool and should not be seen as anything more.

The purpose of applying these methodologies based on learning outcomes and the specific use case determines the demands placed on the reference point. Each purpose of analysing and comparing qualifications, and each context in which this is done, places different demands on the reference point. These requirements can relate to the applicability of the reference point in different national contexts (for instance offering different linguistic versions), but they can also relate to the structure and hierarchy applied in the set of skills used in the reference point, level of detail, types of skills included (occupational or transversal), or whether different performance levels are expressed in the set of skills included. The research found that the ESCO skills pillar offers a promising reference system that may be applied in many contexts, albeit with some specific adaptations depending on the specific purpose and context of use. However, ESCO is far from being

perfect, it needs an improved conceptual basis and of continuous updating and further development.

4.1.2. Conclusions related to research question 2

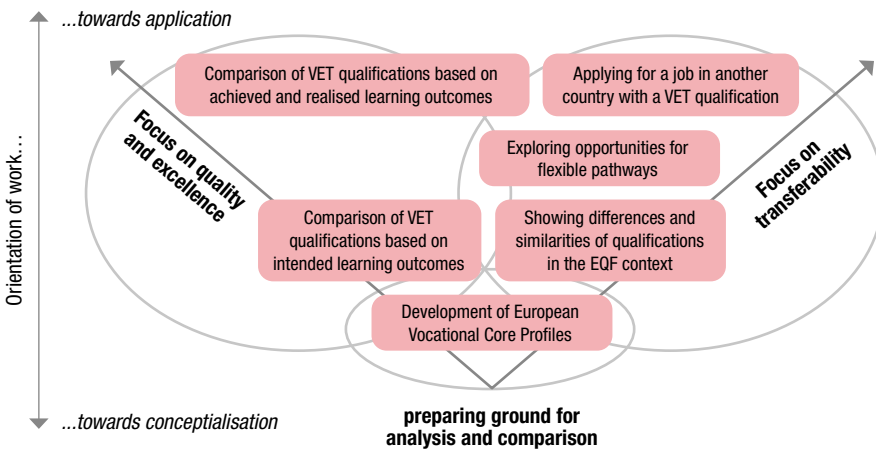
Which purposes, target groups and stakeholders for analysing and comparing qualifications in this context can be identified (use cases)?

Conclusion 3

The study identified seven potential use cases for methodologies for analysing and comparing the content of VET qualifications based on learning outcomes that, while not immediately applicable, can orient future developments in using these methodologies for improving the relevance of VET qualifications and supporting transferability of VET qualifications and their learning outcomes.

The research project explored different reference points, analysed national sources for information on qualifications data (reference documents and databases of qualifications), explored ways for automating comparison of qualifications and methods for comparing intended and acquired learning outcomes. Through this, the research project identified a variety of contexts in which comparative methodologies can be applied, contributing to improvements in the quality and relevance of the content of VET qualifications, improvements in transferability of qualifications and learning outcomes across borders and sectors, and developments towards European vocational core profiles. Within these broad purposes, seven specific use cases were identified for potential applications of the methodologies to be explored. These potential use cases can be positioned in relation to the orientation towards conceptualisation or towards application and in relation to the three purposes for comparison.

Figure 12. **Potential applications and use cases situated within the analytical framework**



Source: Cedefop.

These potential use cases are to be seen as conceptual considerations that can serve relevant stakeholders as a basis for further development. At present, it is not possible to offer ready-made tools and solutions, not least because ESCO, the reference system used in several of the applications to support the analysis and comparison of VET qualifications, and other reference points and related technical solutions, are still work in progress. Conceptual challenges and shortcomings of the approaches also need to be considered. Table 7 provides a concise overview over the identified use cases.

Table 7. **Seven potential use cases, their purpose and specific example**

Orientation	Use case	Purpose	Specific example
Supporting quality, relevance and excellence of VET qualifications	Improving the content and structure of VET qualifications – comparison of VET qualifications based on intended learning outcomes	The analysis and comparison of VET qualifications and their content (the intended learning outcomes), which helps to identify differences and similarities, allows national policy-makers and stakeholders to reflect systematically on and evaluate their own priorities and solutions and to draw inspiration from other countries' decisions and solutions to design, revise or develop their own qualifications.	Using ESCO occupational profiles for the cross-country comparison of qualifications
	Improving the relevance of VET qualifications – comparison between intended and achieved and realised learning outcomes.	This can provide insights into how the learning outcomes acquired by qualification holders are perceived in the labour market and, in particular, by their employers. This type of feedback, also from a comparative perspective, can help better shape the specific profile of qualifications and therefore provide important information for qualifications authorities and for providers offering these qualifications for ensuring their labour market relevance.	Using an employer reflections survey (ERS) approach that allows a direct reflection on VET qualifications' content (focusing on learning outcomes)

Orientation	Use case	Purpose	Specific example
<p>Supporting the transferability of learning outcomes and flexible learning pathways – national & international context</p>	<p>Supporting the levelling of VET qualifications – Showing differences and similarities between qualifications in the EQF context</p>	<p>The EQF aims to provide a comprehensive map of all types and levels of qualifications in Europe, which are increasingly accessible through qualification databases and can serve as a translation tool. However, when looking at qualifications linked to the same EQF level, it is not always clear at first sight why they are actually linked to the same level, as the qualifications themselves can be quite different in scope or specific content. Therefore, in order to understand the allocation decisions, it is necessary to have a deeper insight into the content of the qualifications.</p>	<p>Using a VQTS-based competence matrix for indicating qualification profiles and the steps of competence developments covered</p>

Orientation	Use case	Purpose	Specific example
<p>Supporting the transferability of learning outcomes and flexible learning pathways – national & international context</p>	<p>Supporting mobility in VET</p>	<p>The use of learning outcomes is an important element to help ensure the quality of VET mobility, and to make sure that the learning achieved in another country or context can be recognised, and if possible, that mobility-related achievements can be fully integrated into existing or new learning pathways. The recognition of learning outcomes acquired abroad is likely to become more important if longer duration mobility becomes more common. However, descriptions of qualifications, programmes or parts thereof, even if described in terms of learning outcomes, vary greatly and very often are not immediately comparable at first glance. Here, comparison using a common reference point can help identify learning outcomes that can be addressed in mobility phases.</p>	<p>Using the WorldSkills standards specifications (WSSS) for identifying learning outcomes that can be addressed in mobilities</p>

Orientation	Use case	Purpose	Specific example
<p>Supporting the transferability of learning outcomes and flexible learning pathways – national & international context</p>	<p>Exploring opportunities for flexible learning pathways</p>	<p>For choosing a VET programme in another country, it might be important to learn which VET programmes cover similar learning outcomes and which opportunities there are for changing pathways at a later stage. This could support reducing dropout and could facilitate career switches. The ultimate goal is to provide a tool that supports learners to make smooth transitions from one learning pathway to another.</p>	<p>Using ESCO to present the similarities and differences between two qualification descriptions</p>
	<p>Applying for a job in another country with a VET qualification</p>	<p>Intra-EU Member State mobility of workers, as well as labour migration from third countries, are important aspects in responding to the rapidly changing labour market needs, skills shortages and demographic situation in Europe. To facilitate worker mobility, tools and procedures are needed that can support a better understanding of VET qualifications acquired abroad as well as its comparison with a corresponding national qualification.</p>	<p>Using ESCO occupational profile to understand better the profile of a qualification from another country</p>

Orientation	Use case	Purpose	Specific example
Development of European vocational core profiles	Supporting the development of European vocational core profiles	European vocational core profiles would define a certain share of common training content at European level and should support transparency and recognition. To develop European vocational core profiles based on existing VET qualifications, methods are needed to support the identification of such common learning outcomes	Using ESCO occupational profiles for identifying common learning outcomes

Source: Cedefop.

4.1.3. Conclusions related to research question 3

What is needed in terms of methodologies and necessary conditions to implement the use cases?

Conclusion 4

National VET system characteristics and developments greatly influence the relevance and applicability of the potential use cases for methodologies to improve the relevance of VET qualifications and to support transferability of VET qualifications.

The use cases presented serve the purpose of indicating orientations for future application of comparative methodologies more than providing immediately applicable solutions. There are, besides generic challenges related to applying use cases (see next conclusion), specific national VET characteristics that impact their relevance and applicability. This depends on the particular application, but it can be generally observed that some countries are less likely to use the methodologies explored and developed. For example, in countries where VET is already closely organised in cooperation with labour market stakeholders, and their engagement in the governance of VET and the renewal of qualifications is ensured, the methodologies and the use case related to increasing the relevance of VET by applying an employer

reflection survey seem to be less relevant, compared to countries where the distance between the worlds of work and of education are larger. In countries where the labour market side is traditionally less involved, the methodology developed might be regarded as helpful in offering new perspectives and orientations to bridge the gaps. As VET systems are not static and are subject to periodic reforms, methodologies for analysing and comparing VET qualifications and the potential use cases can show their relevance at a later stage when national stakeholders seek instruments and approaches to support their reform agendas.

Conclusion 5

Generic challenges associated with applying the use cases and the methodologies for analysing and comparing VET qualifications relate mainly to the quality of the reference point (set of skills included), to the learning outcomes descriptions of qualifications, the issue of expressing the level of proficiency of learning outcomes as well as to including context features in comparisons.

When further elaborating on the use cases, there are a number of generic challenges that need to be addressed. The challenges are slightly different for each use case, but refer to similar problems.

- (a) Set of skills included in a reference point: each use case puts different demands on the reference point and the set of skills included. Further conceptual work is required for each use case to support decisions related to the content, scope and orientation of the reference point. One example is the use of a reference point in employer survey approaches. Of key importance is the availability of a suitable list of skills to allow in-depth reflections on the content of the qualifications that is, at the same time, short enough to be used in a survey without burdening the respondents with tiresome lists of skills (good balance regarding complexity and simplicity). Generally, for each use case, the reference point will have to reflect a balance between occupational and transversal skills.
- (b) Learning outcomes descriptions of qualifications: a key factor for successfully applying comparative methodologies is the extent to which and how the qualifications are described in terms of learning outcomes. Countries and VET systems differ a lot in the level at which learning outcomes are described, how they are structured (e.g. grouped per work task or

subject) and the degree of detail provided. This is specifically challenging when aiming at applying automated comparative approaches, as it requires the involvement of human expertise in making informed decisions whether specific learning outcomes are included in national qualification descriptions or not. While substantial progress has been made during recent years, descriptions of qualifications still need to be improved in many cases to serve needs better in this context.

- (c) Level of proficiency expressed in learning outcomes: in several potential use cases, the ability to distinguish the proficiency levels of learning outcomes is desired. Comparing qualifications might not mean much if the level of proficiency is not somehow reflected. While there are reference points that allow differentiating competence areas and higher- and lower-level abilities (such as the VQTS-based competence matrices), such reference points are not systematically available, are available for a few occupational fields and in a few languages only. Differentiation of the steps of competence development, as presented in the VQTS-based competence matrices, makes the mapping process more time-consuming and requires deeper expertise related to the specific qualifications and the work processes in the respective occupational field.
- (d) Contextual factors not expressed in learning outcome statements: a crucial challenge for applying comparative methodologies based on learning as expressed in the use cases, is that national contexts, conceptualisations, philosophies and approaches underlying the design of VET qualifications, the descriptions of learning outcomes and the assumptions behind these descriptions are not explicitly expressed in the learning outcome statements. This could result in identifying similarities between qualification descriptions from different countries, while there are underlying key differences in terms of what these descriptions actually mean in their national context. This is a key conceptual challenge to be considered in any further developments.

Conclusion 6

To ensure zones of mutual trust based on comparative methodologies, these methodologies need to be based on solid research and evidence. There could cost implications that could exceed the potential benefits.

The background of comparative methodologies lies in the development of the EQF and the idea that, within increased transnational mobility, there is a need to establish zones of mutual trust related to qualifications. Zones of mutual trust relate to trust in the levelling of VET qualifications, and also for mutual trust applicable to end-users (citizens and employers) to understand better the content of qualifications. The comparative methodologies can support the development of zones of mutual trust, but only if the comparative methodologies result in useful outcomes and benefits for the end-users. This can only take place when the comparisons are based on solid research approaches, sound conceptual clarifications and solid evidence on similarities and differences between qualifications.

Related to this, comparative methodologies may bring cost implications that exceed their potential benefits. Many of the potential use cases require investment to become fully operational. These investments relate, for example, to further conceptual clarifications and conceptual development of the reference points and tools; to making national qualifications descriptions suitable and accessible to comparison; to implementing support structures to make the outcomes of the comparisons available for the right stakeholders and users; and to supporting structures to keep reference points, national descriptions and the comparison of qualifications continuously up to date.

4.2. Recommendations

This section presents recommendations based on the results of all parts of the study, further research and feedback from stakeholders. The recommendations also refer to future activities to strengthen the quality and relevance of VET qualifications. Methodologies for analysing and comparing the content of VET qualifications and further operationalisation of the use cases require additional work. The recommendations do not focus on fully implementing the use cases, but more on preparing the conceptual ground for applying these methodologies and for further research on them and the use cases. In particular, the recommendations refer to:

- (a) conducting further conceptual work;
- (b) identifying the needs of stakeholders that can be addressed with the methodologies for analysing and comparing VET qualifications and exploring the feasibility of applying the use cases in the national or sectoral context;
- (c) disseminating results in an attractive and accessible way.

4.2.1. Recommendation 1: Conduct further conceptual work

The research conducted in this project points to several needs for improvement related to reference points and sources of information on qualifications, as well as to further conceptual work related to applying the learning outcomes approach for analysing and comparing qualifications and using digital tools for supporting comparison.

- (a) Further development of reference points: the main advantages of ESCO include the fact that it has a wide coverage of occupations and a multilingual approach. However, its shortcomings, as identified in this study but also in other activities, need to be addressed and its conceptual basis improved. There are a number of aspects in which ESCO requires further development, including the conceptual foundation for the set of skills included per occupation and the integration of transversal skills. It is also recommended to explore approaches to include proficiency levels related to the skills included in ESCO. Even if ESCO has turned out to be the most promising reference system for many reasons, this is not to disregard the fact that other reference points may be more suitable for certain purposes of use. Conceptual development should not focus exclusively on ESCO.
- (b) Further development of, and conceptual work on, sources of information on qualifications: although much has already been achieved in this respect, further work needs to be done regarding the transparent description of qualifications. Further efforts are needed to develop common structures of presenting qualifications in the European context, such as in qualification databases as suggested by the EQF Recommendation). It is also recommended to explore and develop learning outcomes descriptions further and the concept of qualifications (without interfering with national priorities) as more clarity is needed on what role learning outcomes play in the overall qualification (do they refer to the overall profile or to parts/units of a qualification) and on what actually is a qualification (how to deal with qualifications that have a high number of optional parts; what could be the role of emerging microcredentials).
- (c) Further conceptual work on using the learning outcomes approach for analysing and comparing qualifications: the use of learning outcomes provides many opportunities but the research has shown there are also many challenges and ambiguities that need to be addressed to improve this approach and its use for comparing qualifications. Further considerations would be important, for example, related to how contextual factors,

which are of crucial importance for understanding qualifications and how they are embedded in the national context, could be better considered when interpreting the outcomes of comparisons. Learning outcomes are not neutral statements and need to be interpreted within the context for which they have been developed. Understanding this context is essential in understanding the outcomes of the analysis. Contextual factors that could be taken into account include the design approach and the philosophy behind developing learning outcomes. This relates to the guidelines used for developing learning outcomes, understanding the level at which learning outcomes are described for a qualification and the structure in which they are described. The following contextual aspects should be considered: the role qualifications play in linking VET to the labour market, the extent to which labour market stakeholders are involved in the development of qualifications, and the roles a VET qualification has in the labour market and for society.

- (d) Further work on digital tools to support the analysis and comparison of qualifications: in order for the methods for analysing and comparing qualifications based on learning outcomes to be used more widely, it is not possible to rely solely on manual mapping of learning outcomes to reference points; this would require far too many resources. There is a need for solutions that are at least semi-automatised. It is recommended to explore further the use of artificial intelligence and digital tools, bearing in mind that it will not be possible in the near future to achieve valid results entirely without human intervention when using digital tools to compare qualifications.

4.2.2. Recommendation 2: Identify needs and explore feasibility of application

In order to ensure the engagement of stakeholders, it is recommended to explore in which countries, in which VET subsystems, in which economic sectors, and by which stakeholders there actually is an interest in applying the methodologies developed. The interest could be due to the provision of specific solutions to their current or (anticipated) future needs. It is also possible that only by reflecting on the possible use cases they will get ideas about the extent to which these methodologies could be helpful for them.

The potential use cases presented in this report are primarily aimed at orienting reflections on how comparative methodologies can support services to improve the relevance of qualifications and to support flexible

pathways, mobility and career guidance. They are not directly applicable and might not always be relevant or needed in a given national or sectoral context. Further research is needed to explore which conditions need to be in place and in which contexts the use cases are relevant and add value to the existing structures and instruments. Aspects to be taken into account particularly concern:

- (a) would a specific use case solve an existing problem/challenge for which there are no other national/sectoral solutions available?
- (b) what conditions need to be in place to have the use case solve the problem?
- (c) would the benefits of developing and implementing the use case outweigh the costs?

This approach would help to identify those areas and sectors that have an interest in the further conceptual work described above and that can also be involved in these activities to generate ownership. The stakeholders identified in this way could be involved in further developments, feasibility testing and piloting in a bottom-up approach. This can ensure that the solutions actually meet their needs and requirements and that the methodologies further developed are ultimately applied.

This exploration should also include an estimation of the resources needed and a clarification of the support structures required. Subsequently, it would be necessary to provide the corresponding resources and the required support. It is recommended to carry out a cost-benefit assessment to clarify to what extent the application of the methodologies actually represents an advantage over other approaches.

This approach could also help to find out from those stakeholders who clearly express a lack of interest in the methodologies what the reasons for this are (such as other priorities or better solutions in place). This could also be used to identify other solutions and approaches that could be integrated or at least considered in these methodologies.

4.2.3. Recommendation 3: Disseminate results in an attractive and accessible way

For stakeholders and beneficiaries (such as VET authorities, VET providers, employers, career guidance professionals) to make use of the methodologies developed, they need to be informed about the benefits in a way that sparks their interest. Potential use cases and (further developed and im-

proved) methodologies and tools need to be tailored to their specific needs and presented in an attractive and accessible way.

One element of this approach could be to develop a database that is structured according to the purposes for which these methodologies can be used (and which need to be closely linked to the needs of the potential users and beneficiaries). This database could be designed to allow different search options, such as for specific purposes, context of use, profile of users and beneficiaries, reference points applied, and examples presented.

Acronyms

AI	artificial intelligence
CEFRL	common European framework of reference for languages
ECVET	European credit system for vocational education and training
ESCO	European skills, competences, qualifications and occupations
EQF	European qualifications framework
ICT	information and communications technologies
ISCED-F	International standard classification of education – fields of education and training
KSC	knowledge, skills, competences
NQF	national qualifications framework
O*NET	occupational information network
OSP	occupational skills profiles
Skills OVATE	online vacancy analysis tool for Europe
TSC	transversal skills and competences
VET	vocational education and training
VQTS	vocational qualifications transfer system
WSSS	WorldSkills standards specification

References

[URLs accessed 12.10.2021]

- Cedefop (2017). *Defining, writing and applying learning outcomes: a European handbook*. Luxembourg: Publications Office of the European Union. http://www.cedefop.europa.eu/files/4156_en.pdf
- Cedefop (2021). *Review and renewal of qualifications: towards methodologies for analysing and comparing learning outcomes*. Luxembourg: Publications Office of the European Union. Cedefop research paper; No 82. <http://data.europa.eu/doi/10.2801/615021>
- Cedefop and ETF (2020). *The importance of being vocational: challenges and opportunities for VET in the next decade. Cedefop and ETF discussion paper*. Luxembourg: Publications Office of the European Union. https://www.cedefop.europa.eu/files/4186_en.pdf
- Clarke, L.; Westerhuis, A. and Winch, C. (2020). Comparative VET European research since the 1980s: accommodating changes in VET systems and labour markets, *Journal of Vocational Education & Training*. <https://doi.org/10.1080/13636820.2020.1858938>
- Council of the European Union (2016). Council Recommendation of 19.12.2016 on upskilling pathways: new opportunities for adults. *Official Journal of the European Union*, C 484, 24.12.2016, pp. 1-6. <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=OJ%3AC%3A2016%3A484%3ATOC>
- Council of the European Union (2020). Council Recommendation of 24 November 2020 on vocational education and training (VET) for sustainable competitiveness, social fairness and resilience. *Official Journal of the European Union*, C 417, 2.12.2020, pp. 1-16. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX-%3A32020H1202%2801%29>
- European Commission (2016). *A new skills agenda for Europe: working together to strengthen human capital, employability and competitiveness: communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*. Brussels, 10.6.2016, COM(2016) 381 final.

[https://ec.europa.eu/transparency/documents-register/detail?ref=COM\(2016\)381](https://ec.europa.eu/transparency/documents-register/detail?ref=COM(2016)381)

European Commission (2017). *ESCO Strategic framework*.

http://eose.org/wp-content/uploads/2018/03/en_ESCO-Strategic-framework.pdf

European Commission (2019). RfS 43 – *Support to the development of the ESCO qualifications pillar*. Final Report v7 – February 2019. Framework Service Contract to provide expertise and support for European cooperation in education, training, youth and sport (EAC/07/2015). Written by Karin Luomi-Messerer (3s) Tine Andersen (DTI) Frank Wilson (Ecorys) and Michael Blakemore (Ecorys).

<https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8181&furtherPubs=yes>

European Commission (2020a). *Communication on a European skills agenda for sustainable competitiveness, social fairness and resilience*.

<https://ec.europa.eu/social/BlobServlet?docId=22832&langId=en>

European Commission (2020b). *Pact for skills*.

<https://ec.europa.eu/social/BlobServlet?docId=23158&langId=en>

European Commission (2020c). *Linking learning outcomes of qualifications with ESCO skills*.

https://ec.europa.eu/esco/portal/escopedia/Linking_learning_outcomes_of_qualifications_with_ESCO_skills

European Commission (2020d). *Call for expression of interest in the second phase of the pilot project for linking learning outcomes of qualifications to ESCO skills*. Brussels, 20 April 2020.

European Commission (2020e). *Proposal for a Council Recommendation on vocational education and training (VET) for sustainable competitiveness, social fairness and resilience*. COM(2020) 275.

<https://ec.europa.eu/social/BlobServlet?docId=22780&langId=en>

European Commission (2020f). *Support services related to quality assurance (EQAVET), graduate tracking and flexibility in Vocational education and training (ECVET)*. Tender specifications. Call for tenders EMPL/2020/OP/0014.

JANZZ.technology (2021). *Analyzing skills data. Can you see the gorilla?* 17. February 2021/in Knowledge Base, News.

<https://janzz.technology/analyzing-skills-data-can-you-see-the-gorilla/>

- Koelink, A.H. (1992). *The comparability of vocational qualifications in Europe*. Report produced at the request of the European Centre for the Development of Vocational Training. Berlin.
- Luomi-Messerer, K. (2009) (ed.). *Using the VQTS model for mobility and permeability – Results of the lifelong learning project VQTS II*. 3s, Vienna. <https://vocationalqualification.net/wp-content/uploads/2018/12/vqtsresult.pdf>
- Noack, M. (2020). A common framework for transversal skills – and how to assess them using competence cards. Paper presented at *The future of VET in Europe – Parallel Session 1 – Transversal skills and the VET curriculum*, 26. November 2020.
- OECD (2019). *Trends shaping education*, 2019. Paris: OECD Publishing.
- OECD (2020). *VET in a time of crisis: building foundations for resilient vocational education and training systems*. Policy Brief, 6 May 2020. https://read.oecd-ilibrary.org/view/?ref=132_132718-fdwm-rqsgmy&title=VET-in-a-time-of-crisis-Building-foundations-for-resilient-vocational-education-and-training-systems-%22
- Osnabrück Declaration (2020). *Declaration on vocational education and training as an enabler of recovery and just transitions to digital and green economies*. 30 November 2020. https://www.cedefop.europa.eu/files/osnabrueck_declaration_eu2020.pdf
- PPMI and 3s (2016). *Study on the feasibility of setting institutional arrangements at European level to ensure management and quality assurance of issues related to an extended scope of the European qualifications framework (EQF): final report*. <https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=28741&no=22>
- Rudowski, M.-E. and Asseraf, G. (2008). *Occupational core profiles: as European approach, paradigm shift or alternative to actual ECVET concepts? A critical discussion*. ECER. <http://www.eera-ecer.de/ecer-programmes/conference/1/contribution/95/>
- Social Research Centre (2019). *2018 Employer satisfaction survey methodological report*.
- TALQ (2017). *TALQ – Transparency in art levels and qualifications*. Interim report.

https://talqsite.files.wordpress.com/2017/05/talq_research_interim-report_def.pdf

TRACKTION partnership (2020). *Building and sustaining successful alumni relations programs in VET schools: how-to guide*.

<https://tracktionerasmus.eu/news/building-and-sustaining-successful-alumni-relations-in-vet-schools-how-to-guide/>

UK ECVET Expert Team (2020). *Quality in international long-duration mobility: lessons from the Erasmus+ Programme*. December 2020.

World Economic Forum (2021). *Building a common language for skills at work: a global taxonomy*. January 2021.

http://www3.weforum.org/docs/WEF_Skills_Taxonomy_2021.pdf

World Economic Forum and The Boston Consulting Group and Burning Glass Technologies (2018). *Towards a reskilling revolution: a future of jobs for all: an insight tool*.

http://www3.weforum.org/docs/WEF_FOW_Reskilling_Revolution.pdf

ANNEX 1

The research team

The following table lists the research team that contributed to the study and the current report.

Name	Role
Karin Luomi-Messerer	Team leader overall FWC & WA4
Simon Broek	Core team – Country expert – Netherlands
Monika Auzinger	Core team – Country expert – Austria
Andrew McCoshan	Country expert – Ireland
Christopher Winch	Country expert – UK-England
Mariya Dzhengozova	Country expert – Bulgaria
Søren Kristensen	Country expert – Denmark
Jouko Luomi	Country expert – Finland
Patrick Werquin	Country expert – France
Vidmantas Tutlys	Country expert – Lithuania
Oriol Homs	Country expert – Spain



ANNEX 2

Illustrating data

The tables below provide data referred to in Sections 3.2, 3.3 and 3.4.

Table A1. **Mapping of health care assistant qualifications to the ESCO occupational profile**

			BG
		EQF level	4
Category	KSC_RelationType	Volume of additional LO KSC	high
Knowledge	Optional	geriatrics	
	Optional	sterilization techniques	
	Optional	older adults' needs	
	Optional	disability types	
	Optional	disability care	
Attitudes	Essential	respond to changing situations in health care	
	Essential	comply with quality standards related to healthcare practice	
Values	Essential	promote inclusion	
	Essential	work in a multicultural environment in health care	
	Essential	empathise with the healthcare user	
Communication, collaboration and creativity	Essential	communicate with nursing staff	
	Essential	develop a collaborative therapeutic relationship	
	Essential	educate on the prevention of illness	
	Essential	provide health education	
	Essential	inform policy makers on health-related challenges	
	Essential	advise on healthcare users' informed consent	
	Essential	convey medical routine information	
	Essential	interact with healthcare users	
	Essential	listen actively	

			BG
		EQF level	4
Category	KSC_RelationType	Volume of additional LO KSC	high
Communication, collaboration and creativity	Essential	work in multidisciplinary health teams	
	Essential	work with nursing staff	
	Essential	accept own accountability	
	Essential	work under supervision in care	
	Essential	support nurses	
	Optional	communicate in foreign languages with health service providers	
	Optional	employ foreign languages for health-related research	
	Optional	employ foreign languages in care	
Information skills	Essential	manage healthcare users' data	
	Essential	identify abnormalities	
	Essential	monitor basic patients signs	
Assisting and caring	Optional	support individuals to adjust to physical disability	
	Essential	use e-health and mobile health technologies	
	Essential	contribute to continuity of health care	
	Essential	apply health sciences	
	Optional	assist in the administration of medication to elderly	
	Essential	ensure safety of healthcare users	
	Essential	comply with legislation related to health care	
	Essential	follow clinical guidelines	
	Essential	adhere to organisational guidelines	
	Essential	deal with emergency care situations	
	Optional	distribute meals to patients	
	Essential	provide basic support to patients	
Management skills	Essential	apply organisational techniques	
	Optional	evaluate older adults' ability to take care of themselves	
Working with computers	Essential	have computer literacy	
Handling and moving	Optional	conduct cleaning tasks	

			BG
		EQF level	4
Category	KSC_ RelationType	Volume of additional LO KSC	high
Category	Cluster	TSC skills concept	
Language skills and competences	[individual language]	mother tongue	
		foreign language	
Life skills and competences	Adopting environmentally friendly practices (Environmental literacy)	follow environmentally-sustainable work practices	
	Digital skills and competences	digital communication and collaboration	
		ICT safety	
		problem-solving with digital tools	
Working with computers	digital content creation		

			BG
		EQF level	4
Category	KSC_ RelationType	Volume of additional LO KSC	high
Self-management skills and competences	Acting according to values	follow ethical code of conduct	
		support company plan	
	Acting independently and showing initiative	work independently	
		identify opportunities	
		demonstrate curiosity	
		demonstrate enthusiasm	
	Dealing with change	adapt to change	
		deal with uncertainty	
	Engaging in self-development	demonstrate willingness to learn	
	Managing negative factors in life and work	manage frustration	
		cope with pressure	
		persist	
	Responding to routine requirements of tasks	follow hygienic work practices	
		follow safety precautions in work practices	
		attend to hygiene	
		attend to detail	
		work efficiently	
		make an effort	
		meet commitments	
Social and communication skills and competences	Collaborating with others in teams and networks	interact with others	
		work in teams	
	Conciliating and negotiating	negotiate compromise	
	Conveying and exchanging information and ideas	report facts	
		use body language	
		manage quality	
		use questioning techniques	
		communicate mathematical information	
		address an audience	

			BG	
		EQF level	4	
Category	KSC_ RelationType	Volume of additional LO KSC	high	
	Managing and leading others	instruct others		
		persuade others		
		motivate others		
		lead others		
	Showing respect and consideration for others	demonstrate consideration		
		demonstrate good manners		
		demonstrate intercultural competence		
		support cultural diversity		
		accept constructive criticism		
	Supporting others	support gender equality		
		give advice to others		
	Thinking skills and competences	Acquiring and organising information	support colleagues	
			manage quantitative data	
Adressing problems and issues		memorise information		
		make decisions		
Analysing and processing information		develop strategy to solve problems		
		carry out work-related measurements		
		evaluate information		
		digital data processing		
		carry out work-related calculations		
		process qualitative information		
		use mathematical tools and equipment		
work with shape and space				
Creating and innovating		think creatively		
Planning and organising		apply quality standards		
		manage time		
		use learning strategies		

DK	IE	ES	FR	LT	NL	AT	FI	UK-EN	
4	4	3	3	3	3	n/a	4	3&4	
low	none	none	low	none	medium	high	high	none	
									7
									5
									4
									2
									8
									8
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									8
									6
									4
72	62	63	55	45	91	75	106	54	

Table A2. **Typology for employer reflection survey****A. General occupation-related skills and competences as exercised in the workplace**

This cluster describes some general occupation-specific skills and competences.

- A1 Applying professional knowledge to job tasks
- A2 Using technology effectively
- A3 Applying technical skills in the workplace
- A4 Maintaining professional standards
- A5 Observing ethical standards
- A6 Using research skills to gather evidence

B. Specific occupation-related skills and competences as exercised in the workplace

For ICT service technician:

- ICT B1 Provide technical documentation
- ICT B2 Perform ICT troubleshooting
- ICT B3 Use repair manuals
- ICT B4 Configure ICT system
- ICT B5 Administer ICT system
- ICT B6 Maintain ICT server/system
- ICT B7 Perform backups
- ICT B8 Repair ICT devices
- ICT B9 Implement ICT recovery system
- ICT B10 Manage ICT legacy implication
- ICT B11 Use precision tools

For Healthcare assistant

- HC B1 Monitor basic patients' signs
- HC B2 Communicate with nursing staff
- HC B3 Empathise with the healthcare user
- HC B4 Interact with healthcare users
- HC B5 Provide basic support to patients
- HC B6 Identify abnormalities
- HC B7 Support nurses
- HC B8 Ensure safety of healthcare users
- HC B9 Convey medical routine information
- HC B10 Manage healthcare users' data
- HC B11 Conduct cleaning tasks

C. Teamwork and interpersonal skills as exercised in the workplace

This cluster describes how the graduate works in an interpersonal context.

- C1 Working well in a team and working collaboratively with colleagues to complete tasks
- C2 Getting on well with others in the workplace and understanding different points of view
- C3 Ability to interact with co-workers from different or multicultural backgrounds
- C4 Ability to follow instructions
- C5 Ability to instruct and/or lead others
- C6 Ability to handle conflicts

4. Employability and enterprise skills as exercised in the workplace

This cluster describes how the graduate works in an organisational context and in the labour market.

- D1 Ability to work under pressure
- D2 Reflect work processes and procedures
- D3 Capacity to be flexible in the workplace
- D4 Ability to meet deadlines
- D5 Understanding the nature of your business or organisation
- D6 Ability to manage processes/projects
- D7 Taking responsibility for personal professional development (keep up to date)
- D8 Demonstrating initiative in the workplace and show sense of initiative
- D9 Ability to solve problems
- D10 Oral communication skills
- D11 Written communication skills
- D12 Foreign language skills
- D13 Working with numbers
- D14 Persistence and endurance
- D15 Critically reflect on own role and place in society

Source: Cedefop.

Table A3. **Employer reflection survey – questionnaire for VET providers**

	Answering category
Introduction	<p>Please provide a short description of the VET qualification in terms of:</p> <ol style="list-style-type: none"> (1) The educational level at which the qualification is offered: (2) The (average) duration of the programme leading to the qualification in years or in months: (3) The extent to which learning at the workplace is included in the programme (including an indication of the share of workplace learning): (4) The number of students currently enrolled in the programme leading to the qualification this school year: (5) The number of graduates from the programme leading to the qualification in the last two school years:
Characterisation of the VET qualification by the VET provider and indication of relevance	<p>You are asked to provide a characterisation of the VET qualification and indicate the extent to which the VET programme provided specific skills to the graduate for effectively working in an enterprise.</p> <p>Skills are grouped into four clusters:</p> <ul style="list-style-type: none"> Cluster A. General occupation-related skills and competences as exercised in the workplace Cluster B. Specific occupation-related skills and competences as exercised in the workplace Cluster C. Teamwork and interpersonal skills as exercised in the workplace Cluster D. Employability and enterprise skills as exercised in the workplace <p>Each cluster will be assessed separately.</p> <p>In relation to each skill, to what extent do you believe that the VET programme has provided them to the graduate for effective work in a company/organisation?</p> <p>If the skill is not relevant to the graduate's workplace, you can select 'Not applicable'.</p> <p>I believe the VET programme provided this skill... *</p> <ol style="list-style-type: none"> (a) Not at all (b) To some extent (c) To a moderate extent (d) To a large extent (e) To a very large extent (f) Not applicable <p>* Referring to the reference point (skills typology)</p>

	Answering category
<p>Indication of the proficiency level provided by the VET programme</p>	<p>For each of the skills mentioned under cluster A) General occupation-related skills and competences and cluster B) Specific occupation-related skills and competences; to what extent has the VET programme provided them to the graduate to make him/her ready for work?</p> <p>To what extent and at what level has the VET programme provided the skills to the graduate to make him/her ready for work? If the skill is not relevant to the graduate's workplace, you can select 'Not applicable'.</p> <p>The VET programme provided the skill at...*</p> <ul style="list-style-type: none"> (a) the basic level enabling work with intensive supervision, assistance and guidance of more experienced employee (b) the sufficient level enabling autonomous execution of the work tasks with some supervision and quality control (c) a high level enabling completely independent execution of tasks by assuming the responsibility of their quality control (d) Not applicable <p><i>* Referring to the reference point (skills typology)</i></p>
<p>Relevance of the learning outcomes provided by the VET qualification</p>	<p>The next set of questions asks about the skills you think are important for recent graduates to have when starting a related job. From the list of skills (*), please select the five most important and the five least important ones.</p> <p><i>* Referring to the reference point (skills typology)</i></p>

Source: Cedefop.

Table A4. **Employer reflection survey – questionnaire for VET graduates**

	Answering category
Screening	<p>What is your name?</p> <p>What is your date of birth? (YYYY/MM/DD)</p> <p>When did you graduate from the VET programme? (Month and Year)</p> <p>What is your current employment status?*</p> <p>(a) Employed in a job related to the VET qualification</p> <p>(b) Employed in a job unrelated to the VET qualification</p> <p>(c) Enrolled in a formal education/training programme</p> <p>(d) Unemployed/inactive (e.g. not looking for a job)</p> <p>(* routing: only those answering 'a' will continue the survey)</p>
Current employment	<p>When did you start your current employment?</p> <p>What is your job title?</p> <p>Please describe your key work tasks in three sentences or less</p> <p>Where do you work?</p> <p>(a) Same city as my VET school</p> <p>(b) Same region as my VET school</p> <p>(c) Another region than where my VET school is located</p> <p>(d) Another country than where my VET school is located</p>
Transition from education and training to employment	<p>Between graduation and starting your current job, what situation(s) apply?</p> <p>Choose one or more of the following situations:</p> <p>(a) I worked in another job (or jobs) related to the VET qualification</p> <p>(b) I worked in another job (or jobs) unrelated to the VET qualification</p> <p>(c) I enrolled in a formal education/training programme</p> <p>(d) I was unemployed and searching for a job</p> <p>(e) I was for any reason inactive (e.g. not looking for a job)</p> <p>In case of b - e, how many months were you not in a job related to the VET qualification?</p>

	Answering category
<p>Achieved learning outcomes</p>	<p>In this section we are interested in your assessment of the extent to which the VET programme has prepared you for effective work in your company/organisation.</p> <p>The skills are grouped into four clusters: Cluster A. General occupation-related skills and competences as exercised in the workplace Cluster B. Specific occupation-related skills and competences as exercised in the workplace Cluster C. Teamwork and interpersonal skills as exercised in the workplace Cluster D. Employability and enterprise skills as exercised in the workplace</p> <p>Each cluster will be assessed separately.</p> <p>To what extent do you believe that you have acquired the individual skills through the VET programme?</p> <p>If the skill is not required in the job you are doing, you can select 'Not applicable'.</p> <ul style="list-style-type: none"> (a) I believe I have acquired this skill...* (b) Not at all (c) To some extent (d) To a moderate extent (e) To a large extent (f) To a very large extent (g) Not applicable <p><i>* Referring to the reference point (skills typology)</i></p>

	Answering category
Relevance of the content of the VET programme for the job	<p>The next set of questions concerns the skills that you think are important for a graduate to have when taking up a related job. Please answer these questions in relation to your current job.</p> <p>From the list of skills (*), please select the five most important and the five least important ones.</p> <p><i>* Referring to the reference point (skills typology)</i></p>
Satisfaction with overall graduate preparation	<p>Overall, how well did the VET programme prepare you for your current job?</p> <p>(a) Not at all (b) Not well (c) Well (d) Very well (e) Don't know / Unsure</p> <p>Please explain your answer: ...</p>
Consent to be approached	<p>May we contact you for further questions, for additional information/insights on the topics in this survey?</p> <p>No Yes, you can contact me via email:</p>

Source: Cedefop.

Table A5. **Employer reflection survey – questionnaire for employers**

	Answering category
Screening and confirmation	<p>Is there someone working (or that has worked) in your company that recently (in the last 2 years) graduated from a VET college (in the remaining of the survey we refer to this person as 'the graduate')?</p> <p>(a) Yes (b) No</p>
	<p>Is this VET qualification:</p> <p>(a) A formal requirement for entering the job (required by law) (b) A prerequisite for entering the job (required by the company) (c) A desired qualification for entering the job (preferable, 'nice to have') (d) Not a preferred qualification</p>
	<p>What is your main occupation/position in the organisation?</p> <p>(a) Company owner (b) Manager (c) Regular employee (a) Mentor/in-company trainer (d) HR staff (e) Other:</p>
	<p>What is the name of the company/organisation?</p>
	<p>How big is the company/organisation in terms of the number of employees?</p>
	<p>Please describe the main line(s) of business of the company/organisation (2-3 sentences).</p>
	<p>What is the geographical focus of the company/organisation? (multiple answers possible)*</p> <p>(a) Local (b) Regional (c) National (d) European (e) International</p>

	Answering category
<p>Achieved skills (learning outcomes)</p>	<p>In this section we are interested in your assessment of the extent to which the VET programme has prepared the graduate for effective work in your company/organisation</p>
	<p>Skills are grouped into four clusters: Cluster A. General occupation-related skills and competences as exercised in the workplace Cluster B. Specific occupation-related skills and competences as exercised in the workplace Cluster C. Teamwork and interpersonal skills as exercised in the workplace Cluster D. Employability and enterprise skills as exercised in the workplace Each cluster will be assessed separately.</p>
	<p>In relation to each skill, to what extent do you believe that the VET programme has provided them to the graduate for effective work in your company/organisation?</p> <p>If the skill is not relevant to the graduate’s current job, you can select ‘Not applicable’.</p> <p>I believe the graduate acquired this skill...*</p> <ul style="list-style-type: none"> (a) Not at all (b) To some extent (c) To a moderate extent (d) To a large extent (e) To a very large extent (f) Not applicable
<p>Indication of the proficiency level provided by the VET programme</p>	<p>For each of the skills mentioned under cluster A) General occupation-related skills and competences and cluster B) Specific occupation-related skills and competences, to what extent has the VET programme provided skills to the graduate to make him/her ready for work?</p>
	<p>To what extent and at what level has the VET programme provided the skills to the graduate to make him/her ready for work?</p>
	<p>If the skill is not relevant in the graduate’s current job, you can select ‘Not applicable’.</p> <p>The VET programme provided the skill at... .</p> <ul style="list-style-type: none"> (a) the basic level enabling work with intensive supervision, assistance and guidance of more experienced employee (b) the sufficient level enabling autonomous execution of the work tasks with some supervision and quality control (c) a high level enabling completely independent execution of tasks by assuming the responsibility of their quality control (d) Not applicable <p>* Referring to the reference point (skills typology)</p>

	Answering category
Relevance of the learning outcomes provided by the VET qualification	<p>The next set of questions asks about the skills you think are important for recent graduates to have when starting a related job.</p> <p>From the list of skills (*), please select the five most important and the five least important ones.</p> <p><i>* Referring to the reference point (skills typology)</i></p>
Overall satisfaction	<p>Overall, how well did the VET programme prepare the graduate for their job?</p> <p>(a) Not at all (b) Not well (c) Well (d) Very well (e) Don't know / Unsure</p> <p>Please explain your answer: ...</p>
	<p>On the basis of your experience with the graduate you were reflecting on in this survey, how likely is it that you would consider hiring another graduate of this VET programme / with this VET qualification if you had a corresponding vacancy?</p> <p>Would you say this is...</p> <p>(a) Very unlikely to consider (b) Unlikely to consider (c) Neither unlikely nor likely to consider (d) Likely to consider (e) Very likely to consider (f) Don't know / Unsure</p> <p>Please explain your answer: ...</p>
Consent to be approached	<p>May we contact you for further questions, for additional information/insights on the topics in this survey?</p> <p>(a) No (b) Yes, you can contact me via email</p>

Source: Cedefop.

Table A6. Using the VQTS/HCEU competence matrix for comparing healthcare assistant qualifications

Competence area	Sub-area of competence	
Assessment, diagnosis, planning professional care	Gathering data	1.1.a To be able to assist in conducting professional care assessment.
	Nursing diagnosis	1.2.a To be able to assist in developing the nursing diagnoses based on collected data.
	Planning professional care	1.3.a To be able to assist in developing, revision and adaption of the professional care plan.
Nursing care	Basic care and personal hygiene	2.1.a To be able to support the patient/client to perform basic care.
	Nutrition	2.2.a To be able to order and distribute meals and, if necessary, support patients/clients without specific dietary restrictions or functional limitations according to nutrition plans.
	Mobility, movement, positioning	2.3.a To be able to assist in mobility measures including patient/client activation according to patient's/client's treatment plan and individual condition.
	Excretion	2.4.a To be able to support patients/clients in excretion.

DK (grey) vs. IE (pink)

1.1.b To be able to conduct professional care assessment.	1.1.c To be able to guide and supervise the complete professional care assessment.
1.2.b To be able to develop and revise nursing diagnoses based on collected data.	1.2.c To be able to guide and supervise others in developing and revision of nursing diagnoses
1.3.b To be able to develop, revise and adapt the professional care plan.	1.3.c To be able to (a) apply and develop special care plans (b) guide and supervise the development, revision and adaptation of the professional care plan.
2.1.b To be able to perform basic care in all care cases.	2.1.c To be able to guide and supervise others in performing basic care in all care cases.
2.2.b To be able to assist in preparing and adapting a nutrition plan according to patients'/clients' individual condition and functional limitations, handle enteral nutrition and to place and handle feeding tubes.	2.2.c To be able to independently prepare and adapt a nutrition plan according to patient's/client's individual condition and functional limitations; place and handle feeding tubes.
	2.2.d To be able to guide and supervise the handling of enteral nutrition and placing and handling of feeding tubes.
2.3.b To be able to implement mobility measures including patient/client activation according to patient's/client's treatment plan and individual condition.	2.3.c To be able to guide and supervise the implementation of mobility measures.
2.4.b To be able to assist in placing and caring of catheters, placing and handling enemas and bowel catheter systems	2.4.c To be able to place and care for urinary catheters, place and handle enemas and bowel catheter systems.
	2.4.d To be able to guide and supervise all measures related to excretion.

Competence area	Sub-area of competence	
Nursing intervention	Participating in medical and diagnostic procedures	3.1.a To be able to prepare and support patient's/client's for medical treatments and diagnostic tests according to prescription; assist in preparing of medical devices and materials; collect and assist in collecting patient's/client's specimens for treatments.
	Preparing and administering medication	3.2.a To be able to administer oral and subcutaneous medication according to prescription.
	Wound management	3.3.a To be able to take care of wounds; prevent wounds; assist in wound care.
	Stoma Management	3.4.a To be able to assist in assessing and taking care of stomas according to prescription.
	Dealing with medical devices	3.5.a To be able to assist in managing and if applicable placing medical devices according to medical products and guidelines.
	Basic and Advanced life support (BLS/ALS)	3.6.a To be able to provide BLS according to resuscitation guidelines.

DK (grey) vs. IE (pink)

<p>3.1.b To be able to prepare and support patient's/client's for medical treatments and diagnostic tests according to prescription; collect all kinds of patient's/client's biological specimens for treatments; assist other professionals in medical and laboratory treatments.</p>	<p>3.1.c To be able to guide and supervise others in the participating in treatments and diagnostic procedures.</p>	
<p>3.2.b To be able to prepare and administer all medication (apart from intra-arterial and intrathecal applications) according to prescription.</p>	<p>3.2.c To be able to guide and supervise the medication process.</p>	
<p>3.3.b To be able to assess wounds; apply and to change wound dressings according to prescription.</p>	<p>3.3.c To be able to guide and supervise others in wound care.</p>	
<p>3.4.b To be able to assess and take care of stomas according to prescription.</p>	<p>3.4.c To be able to guide and supervise others in assessing and taking care of stomas according to prescription.</p>	
<p>3.5.b To be able to manage and if applicable place medical devices according to medical products and guidelines.</p>	<p>3.5.c To be able to assist in and to perform related medical procedures.</p>	<p>3.5.d To be able to guide and supervise others in the use and maintenance of medical devices and related procedures.</p>
<p>3.6.b To be able to assist in applying ALS according to resuscitation guidelines and in cooperation with authorised medical personnel.</p>	<p>3.6.c To be able to apply ALS according to resuscitation guidelines and in cooperation with authorised medical personnel.</p>	<p>3.6.d To be able to guide and supervise others in providing BLS and ALS according to resuscitation guidelines</p>

Competence area	Sub-area of competence	
Creating and maintaining a healthy and safe environment	Hygiene	4.1.a To be able to apply relevant (legal and employer-specific) hygienic procedures and guidelines regarding personnel hygiene, working environments, medical equipment, medical waste.
	Sterilisation	4.2.a To be able to clean, disinfect, sterilise and store m
	Occupational health and safety	4.3.a To be able to promote a health promoting and safe environment and to implement related measures.
	Handling onsite disasters	4.4.a To be able to react according to guidelines in emergencies and disasters.
Communication and collaboration with other professionals	Train and manage other professional caregivers in work activities	5.1.a To be able to contribute to informing and monitoring other professional caregivers regarding daily working routines. (e.g. show others acts in daily routine in absence of the practical instructor)
	Professional communication	5.2.a. To be able to communicate within the multidisciplinary team and with other staff, apply professional language.
	Integrated care	5.3.a. To be able to apply to the requirements of patient/client management. (e.g. discharge, intake, occupancy management)

DK (grey) vs. IE (pink)

<p>4.1.b To be able to guide and supervise the correct application of hygiene regulations.</p>	<p>4.1.c To be able to contribute to the evaluation and revision of hygienic procedures and guidelines, execute tests regarding hygiene.</p>	
<p>4.2.a To be able to sterilise medical instruments according to sterility rules.</p>	<p>4.2.b To be able to guide and supervise the complete sterilisation process and to apply document of quality control indicators and protocols.</p>	
<p>4.3.b To be able to detect safety risks and to increase safety by implementing preventive measures.</p>	<p>4.3.c To be able to develop assessment tools to prevent safety risks and to monitor the maintenance of a safer environment.</p>	
<p>4.4.b To be able to coordinate emergencies and disasters as well as care about victims.</p>	<p>4.4.c To be able to prepare guidelines and strategies for emergencies and disasters and to develop and execute appropriate trainings.</p>	
<p>5.1.b To be able to inform and monitor other professional caregivers concerning daily working routines and individual tasks, make decisions in absence of the person in charge. (e.g. take over management of the ward in absence of the ward manager)</p>	<p>5.1.c To be able to guide and supervise tasks and activities performed by other professional caregivers according to pedagogical and subject related principles, (e.g. educate others as a practical instructor) contribute to the development of new care standards, instruction guidelines and protocols.</p>	
<p>5.2.b To be able to collaborate with other health care professionals in working processes, network within the multidisciplinary team and with other professionals, advocate for the patients/clients. (e.g. represent the interests of patient's/client's who are unable to do so themselves to physicians)</p>	<p>5.2.c To be able to participate in developing, implementing and evaluating mechanisms for optimising the processes of multidisciplinary collaboration.</p>	
<p>5.3.b To be able to apply disease management, contribute to case management.</p>	<p>5.3.c To be able to implement disease and case management in the facility, cooperate with internal and external partners in order to implement integrated care.</p>	<p>5.3.d To be able to implement and further develop integrated care within the facility, network with external partners in order to improve integrated care.</p>

Competence area	Sub-area of competence	
Communication and collaboration with patients/clients	Communication with patients/clients and relevant others	6.1.a To be able to build, maintain and end verbal and non-verbal communication and show appreciation.
	Education and empowerment	6.2.a To be able to explain treatment and care related information to the patient/client and relevant others.
	Health promotion and prevention	6.3.a To be aware of developments on health promotion and prevention and to be able to provide, motivate and support preventive measures in the care process. (e.g. care advice, family health care, public health care)
	Fostering social life and a stimulating environment	6.4.a To be able to foster health promotion with the patient/client's activities and the living environment. (e.g. integration in the living environment)
	Organising daily life and daily life activities	6.5.a To be able to support the patient/client in organising daily life (e.g. shopping)
Management	Monitoring and evaluating of patient's/client's condition	A.1.a To be able to recognise changes in the patient's/client's condition and react appropriately.

DK (grey) vs. IE (pink)

on-verbal communication through empathy and

6.1.b To be able to assess the patient's/client's capability of cognitive/emotional response and behaviour using professional techniques/tools, use professional communication models/tools. (e.g. RTR measurement, assessment of facial expressions, gestures)

6.2.b To be able to train, counsel and empower patient's/client's and relevant others regarding self-care.

6.2.c To be able to identify learning needs of patient's/client's and relevant others.

6.2.d To be able to efficiently use professional methods of interpersonal communication in challenging situations. (e.g. lip-read, Watzlawick)

6.3.b To be able to implement care processes facilitating health promotion and prevention and the independency of the patient/client, coordinate the collaboration with the multidisciplinary team in order to motivate and support the patient's/client's health promotion and health prevention activities. (e.g. teaching patient's/client's about diabetes while connect the needs to the schedule of the day, organise and offer sports activities for patient's/client's with restrictions on self-care)

6.3.c To be able to contribute to the development and the implementation of health promotion/prevention within the health system.

ent/client by using creative elements, social to musical activities)

6.4.b To be able to plan and carry out complex activities of daily life and to participate in arranging/ furnishing living environments. (e.g. arrange celebrations)

ng his/her daily life. (e.g. accompany when

6.5.b To be able to act on behalf of the patient/client in aspects of their daily life. (e.g. work with the social security office to receive support money)

A.1.b To be able to recognise changes in the patient's/client's condition using scoring tools and react appropriately, interrelate the patient's/client's condition to disease pattern.

A.1.c To be able to guide and supervise others in monitoring and evaluating the patient's/client's condition

Competence area	Sub-area of competence	
Management	Documentation	A.2.a To be able to independently document all required
	Promoting quality assurance measures	A.3.a To be able to ensure nursing care while considering quality aspects.
	Ethical competence	B.1.a To be able to apply professional care based on ethical challenges in professional care and react appropriately.
	Intercultural competence	B.2.a To be able to recognise and show understanding for potential needs and challenges of patient's/client's according to cultural differences and similarities and to react appropriately.
	Legal framework	B.3.a To be able to act professionally in accordance to legal standards of nursing practice and to existing laws)
	Identifying and addressing professional training needs	C.1.a To be able to critically reflect one's own competences and to identify training needs.
	Development of the profession	C.2.a To be able to differentiate between professional care and other health care professions
	Professional care research	C.3.a To be able to understand scientific publications in the field of nursing care.

DK (grey) vs. IE (pink)

<p>data of the patient/client.</p>	<p>A.2.b To be able to guide and supervise the documentation.</p>	
<p>A.3.b To be able to convey the meaning of evidence-based care into daily work and to use existing quality systems.</p>	<p>A.3.c To be able to perform quality assurance tasks and to guide and supervise others in delivering quality care.</p>	<p>A.3.d To be able to establish, implement and develop quality management and quality management systems.</p>
<p>ical principles and concepts, recognise and manage appropriately.</p>	<p>B.1.b To be able to critically reflect ethical issues and support and guide others in ethical decision making</p>	
<p>B.2.b To be able to manage intercultural challenges with conflict potential and develop solution strategies. (e.g applying culture-sensitive care)</p>	<p>B.2.c To be able to mediate intercultural challenges, guide other staff members and patient's/client's.</p>	<p>B.2.d To be able to initiate and moderate meetings on ethical issues, participate in ethics commissions.</p>
<p>egislation on health care (e.g. act according to</p>	<p>B.3.b To be able to ensure compliance with laws and company regulations. (e.g. working law, law regarding to medical products)</p>	
<p>C.1.b To be able to implement life-long learning in the professional care environment.</p>	<p>C.1.c To be able to identify and select appropriate continuous education opportunities in order to follow them.</p>	<p>C.1.d To be able to identify training needs of other caregivers and support them in their professional development.</p>
<p>C.2.b To be able to critically reflect one's profession and position within health care, the social system and society.</p>	<p>C.2.c To be able to identify trends and developments within the health care and social system and their impacts on care professions.</p>	
<p>C.3.b To be able to critically interpret and evaluate research findings and to incorporate relevant findings in the daily practice</p>	<p>C.3.c To be able to support others in research projects and to participate in research in the field of professional care.</p>	

Table A7. Using the WorldSkills standards specifications for comparing IT technician qualifications

		DK	AT	
		4	4	
		none	high	
		EQF level		
		Volume of additional LO		
Communication and interpersonal skills	The individual needs to know and understand:	Techniques for effective team work		
		Techniques for resolving misunderstandings and conflicting demands		
		The importance of building and maintaining productive working relationships with colleagues and managers		
		The importance of listening as part of effective communication		
		The process for managing tension and anger to resolve difficult situations		
		The roles and requirements of colleagues and the most effective methods of communication		
	The individual shall be able to:	Demonstrate strong listening and questioning skills to deepen understanding of complex situations		
		Effectively manage tension/anger and give individuals confidence that their problems can be resolved		
		Manage consistently effective verbal and written communications with colleagues		
		Pro-actively contribute to the development of a strong and effective team		
		Recognize and adapt to the changing needs of colleagues		
		Share knowledge and expertise with colleagues and develop a supportive learning culture		
		Configuring networking devices	The individual needs to know and understand:	Implement networking services as required by customer
Networking environments				
Networking protocols e.g. IPv6				
Precautions which need to be taken to avoid issues arising from changing network configuration on operational equipment				
The importance of documenting the (rational for as well as all) final configuration settings				

		DK	AT	
		4	4	
		none	high	
Configuring networking devices	The individual needs to know and understand:	The process for building a network and how network devices can be configured to enable efficient communication		
		The range of network devices e.g. routers, VoIP, IP devices e.g. security cameras, printers, wireless access points, and inter-networking connectivity		
	The individual shall be able to:	Apply all types of different configurations, including software and hardware upgrades, on all kinds of networking devices that can appear in a network environment to include: Routing protocols, Network Security, Wi-Fi, VoIP, etc.		
		Design and implement disaster recovery procedures		
		Discuss the proposed solution for role/feature and agree with relevant parties e.g. users, colleagues and managers		
		Interpret user demands and design requirements to industry certification requirements		
		Maintain configuration records		
		Select appropriate services to meet customer requirements		
		Work with other team members and follow required procedures to achieve successful configuration		

		DK	AT	
		4	4	
		none	high	
Design	The individual needs to know and understand:	Address schemes		
		Configuration documentation required e.g. installation instructions		
		Logical and functional diagrams		
		Network environments and topologies		
		Security options and their impact		
		The types and location requirements of active network devices e.g. routers and switchers		
	The individual shall be able to:	Accurately transfer the customer wishes to a logical diagram		
		Discuss the technical design requirements for operating systems and networking devices at the appropriate level of responsibility and accountability within the client organization		
		Give knowledgeable/best advice and possible solutions to customer to meet technical and security requirements		
		Match budget/resource restraints with best possible client solutions		
		Prepare a document and get sign off		
		Prepare configuration documentation		
		Undertake pre-acceptance testing of the concept		

		DK	AT	
		4	4	
		none	high	
Install, up-grade, and configure operating systems	The individual needs to know and understand:	The basic functions of the hardware and the process for setting-up		
		The importance of following instructions and the consequences/costs of not adhering to them		
		The precautions that need to be actioned before an installation or an upgrade		
		The process for selecting the appropriate driver for different kinds of hardware		
		The purpose of documenting the completion of the installation or up-grade		
		The range of operating systems and their abilities to match particular user requirements, given the user budget requirements		
	The individual shall be able to:	Accurately identify the hardware and appropriate software driver required to match user/manufacturer specifications		
		Closely listen, translate, and accurately identify user needs to ensure expectations are met		
		Configure the appropriate role/feature following manufacturer's instructions or best practice within the organization		
		Consistently check manufacturers guidance for up-grading regarding 'work flow'		
		Discuss the proposed solution for role/feature and agree with relevant parties e.g. users, colleagues and managers		
		Gain user acceptance and record		
		Prepare a technical document reflecting the solution in detail for agreement and sign-off		
		Select the operating system: proprietary/open source, total cost of ownership in relation to customer resources		
		Select the roles and/or features of the operating/server system e.g. Active Directory Domain Services (role) and Window Server Back-up (feature)		
Test and rectify any problems and re-test as appropriate				

		DK	AT	
		4	4	
		none	high	
Troubleshoot- ing	The individual needs to know and understand:	Boundaries of own knowledge/skills/authority and sources of support/escalation procedures		
		Diagnostic and analytical approaches to problem solving		
		Standard resolution times for common problems		
		The common types of hardware/software errors which can occur		
		The importance of a calm and focused approach in solving a problem		
		The significance of IT systems and the dependency of individuals and organizations on its constant availability		
	The individual shall be able to:	Accurately record problem and provide resolution report		
		Approach a problem with the appropriate level of confidence to calm the user as necessary		
		Challenge incorrect information to prevent/minimize problems		
		Check user satisfaction level after a problem has been addressed		
		Check work regularly to prevent/minimize problems at a later stage		
		Demonstrate resilience and persistence when dealing with problems		
		Recognize and understand problems swiftly and follow a self-reliant and managed process for resolving		
		Seek support when further expertise is necessary and avoid temptation to 'be consumed' by the challenge of the problem		
		Select and use diagnostic software and tools to identify problems		
		Support users in resolving problems through advice, guidance, and instruction		
		Thoroughly investigate and analyse complex problems/situations and apply fault finding processes		

		DK	AT	
		4	4	
		none	high	
User support and consultancy	The individual needs to know and understand:	Coaching techniques to meet individual learning styles		
		Different demonstration and presentation techniques to support the development of users' skills and knowledge		
		Different methods of assessing user's abilities in order to support immediate needs and encourage personal development		
		Negotiation techniques for different situations e.g. a project tender		
		Planning and scheduling techniques to facilitate a consistently high level of service, to meet the needs of the user and the organization		
		The features of a defined range of IT systems to enable a good breadth of support		
		Trends and developments in the industry and types of improvement which could be introduced to the user		

		DK	AT	
		4	4	
		none	high	
EQF level	Volume of additional LO			
User support and consultancy	The individual shall be able to:	Accurately determine user requirements and effectively manage expectations		
		Contribute to bids and tenders for projects		
		Effectively demonstrate IT systems to individuals and teams to enable them to grow their skills and knowledge		
		Plan, schedule, prioritize and regularly re-prioritize requests for IT support in order to meet and balance the needs of the individual and the organization		
		Pro-actively maintain currency of IT systems knowledge		
		Produce a cost and time estimate for work to be completed		
		Provide accurate up-to-date advice on up-grading and sourcing new IT products and services to support decision-making		
		Recognize opportunities to contribute ideas to improve the product and overall level of user satisfaction		
		Respond appropriately within target time-scales, to users within an organization and those based remotely, in order to provide the appropriate level of IT support		
		Select appropriate demonstration techniques to suit different levels of experience/capability		
		Successfully coach individuals 'face-to-face' and remotely to resolve IT problems, introduce new products and develop their skills and knowledge		
		Translate needs, making recommendations which meet requirements e.g. budgets		

		DK	AT	
		4	4	
		none	high	
Work organization and management	The individual needs to know and understand:	Collaboration and research methods and techniques		
		Health and safety legislation, obligations, regulations, and documentation		
		The ability to seek assistance from peers when lacking in experience or knowledge in a particular area		
		The importance of integrity and security when dealing with user equipment and information		
		The importance of methodical working practices		
		The importance of safe disposal of waste for re-cycling		
		The significance of accuracy, checking, and attention to detail in all working practices		
		The situations when personal protective equipment (PPE) must be used, e.g. for ESD (electrostatic discharge)		
		The speed of IT systems change and the need to maintain currency		
		The techniques of planning, scheduling, and prioritizing		
		The value of managing own continuing professional development		

		DK	AT	
		4	4	
		none	high	
Work organization and management	The individual shall be able to:	Collaborate with work colleagues effectively to maximize efficiency and learning		
		Demonstrate enthusiasm to try new methods, systems, and embrace change		
		Demonstrate thorough and efficient research methods to support knowledge growth		
		Follow health and safety standards, rules, and regulations		
		Identify and use the appropriate Personal Protective Equipment for ESD		
		Keep up-to-date with 'license to practice' requirements and maintain currency		
		Maintain a safe working environment		
		Plan the work area to maximize efficiency and maintain the discipline of regular tidying		
		Regularly schedule, re-schedule, and multi-task according to changing priorities		
		Select, use, clean, maintain, and store tools and equipment safely and securely		
		Undergo various certification requirements, such as: Cisco, Microsoft, and Linux, specializing in at least one specific area		
		Work effectively as a member of a project team		
		Work efficiently and check progress and outcomes regularly		

115	89	93
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Work organization and management - coverage	79%	83%
Communication and interpersonal skills - coverage	33%	58%
User support and consultancy - coverage	63%	89%
Troubleshooting - coverage	82%	53%
Design - coverage	85%	100%
Install, up-grade, and configure operating systems - coverage	94%	88%
Configuring networking devices - coverage	100%	93%

Table A8. Using an ESCO occupational profile for comparing IT technician qualifications

			IE	AT
		EQF level	4	4
		Volume of additional LO	none	high
Level 1 Title	KSC Relation Type	Level 1 Title		
Knowledge	Optional	ICT market		
	Essential	procurement of ICT network equipment		
	Essential	distributed directory information services		
	Essential	ICT network routing		
	Optional	service-oriented modelling		
	Optional	ICT encryption		
	Optional	R		
	Optional	ICT debugging tools		
	Optional	systems thinking		
	Optional	ICT system user requirements		
	Optional	ICT system programming		
	Optional	computer programming		
	Optional	Microsoft Visual C++		
	Essential	ICT networking hardware		
	Essential	ICT network cable limitations		
	Optional	ICT communications protocols		
Communication, collaboration and creativity	Optional	use different communication channels		
	Optional	create solutions to problems		
Information skills	Essential	use repair manuals		
	Optional	provide technical documentation		
	Essential	keep up to date on product knowledge		
Management skills	Optional	manage schedule of tasks		

			IE	AT
			4	4
			none	high
Working with computers	Essential	maintain ICT server		
	Essential	maintain ICT system		
	Optional	configure ICT system		
	Essential	administer ICT system		
	Essential	perform backups		
	Essential	define firewall rules		
	Optional	use access control software		
	Essential	perform ICT troubleshooting		
	Essential	implement ICT recovery system		
	Optional	manage ICT legacy implication		
	Essential	manage email hosting service		
Handling and moving	Essential	use precision tools		
Working with machinery and specialised equipment	Essential	operate private branch exchange		
	Essential	repair ICT devices		
Category	Cluster	TSC skills concept		
Language skills and competences	[individual language]	mother tongue		
	[individual language]	foreign language		
Life skills and competences	Adopting environmentally friendly practices (Environmental literacy)	follow environmentally-sustainable work practices		
	Digital skills and competences	ICT safety		
		problem-solving with digital tools		
		digital communication and collaboration		
Working with computers	digital content creation			

			IE	AT
		EQF level	4	4
		Volume of additional LO	none	high
Self-man- agement skills and competences	Acting according to values	support company plan		
		follow ethical code of conduct		
	Acting independently and showing initiative	work independently		
		identify opportunities		
		demonstrate curiosity		
		demonstrate enthusiasm		
	Dealing with change	adapt to change		
		deal with uncertainty		
	Engaging in self-development	demonstrate willingness to learn		
	Managing negative factors in life and work	cope with pressure		
		manage frustration		
		persist		
	Responding to routine requirements of tasks	follow safety precautions in work practices		
		attend to hygiene		
		meet commitments		
		work efficiently		
		follow hygienic work practices		
		attend to detail		
		make an effort		

			IE	AT
		EQF level	4	4
		Volume of additional LO	none	high
Social and communication skills and competences	Collaborating with others in teams and networks	interact with others		
		work in teams		
	Conciliating and negotiating	negotiate compromise		
	Conveying and exchanging information and ideas	report facts		
		communicate mathematical information		
		manage quality		
		address an audience		
		use questioning techniques		
		use body language		
	Managing and leading others	instruct others		
		lead others		
		motivate others		
		persuade others		
	Showing respect and consideration for others	demonstrate consideration		
		accept constructive criticism		
		support cultural diversity		
		support gender equality		
		demonstrate good manners		
		demonstrate intercultural competence		
	Supporting others	give advice to others		
support colleagues				

			IE	AT
		EQF level	4	4
		Volume of additional LO	none	high
Thinking skills and competences	Acquiring and organising information	manage quantitative data		
		memorise information		
	Addressing problems and issues	make decisions		
		develop strategy to solve problems		
	Analysing and processing information	carry out work-related calculations		
		evaluate information		
		digital data processing		
		carry out work-related measurements		
		process qualitative information		
		use mathematical tools and equipment		
	Creating and innovating	work with shape and space		
		think creatively		
	Planning and organising	apply quality standards		
		manage time		
		use learning strategies		

98	84	71
	86%	72%

Table A9. Mapping of health care assistant qualifications to the ESCO occupational profile

			BG
		EQF level	4
Category	KSC_RelationType	Volume of additional LO KSC	high
Knowledge	Optional	geriatrics	
	Optional	sterilization techniques	
	Optional	older adults' needs	
	Optional	disability types	
	Optional	disability care	
Attitudes	Essential	respond to changing situations in health care	
	Essential	comply with quality standards related to healthcare practice	
Values	Essential	promote inclusion	
	Essential	work in a multicultural environment in health care	
	Essential	empathise with the healthcare user	
Communication, collaboration and creativity	Essential	communicate with nursing staff	
	Essential	develop a collaborative therapeutic relationship	
	Essential	educate on the prevention of illness	
	Essential	provide health education	
	Essential	inform policy makers on health-related challenges	
	Essential	advise on healthcare users' informed consent	
	Essential	convey medical routine information	
	Essential	interact with healthcare users	
	Essential	listen actively	

			BG
		EQF level	4
Category	KSC_RelationType	Volume of additional LO KSC	high
	Essential	work in multidisciplinary health teams	
	Essential	work with nursing staff	
	Essential	accept own accountability	
	Essential	work under supervision in care	
	Essential	support nurses	
	Optional	communicate in foreign languages with health service providers	
	Optional	employ foreign languages for health-related research	
	Optional	employ foreign languages in care	
Information skills	Essential	manage healthcare users' data	
	Essential	identify abnormalities	
	Essential	monitor basic patients signs	
Assisting and Caring	Optional	support individuals to adjust to physical disability	
	Essential	use e-health and mobile health technologies	
	Essential	contribute to continuity of health care	
	Essential	apply health sciences	
	Optional	assist in the administration of medication to elderly	
	Essential	ensure safety of healthcare users	
	Essential	comply with legislation related to health care	
	Essential	follow clinical guidelines	
	Essential	adhere to organisational guidelines	
	Essential	deal with emergency care situations	
	Optional	distribute meals to patients	
	Essential	provide basic support to patients	
	Management skills	Essential	apply organisational techniques
Optional		evaluate older adults' ability to take care of themselves	
Working with computers	Essential	have computer literacy	
Handling and moving	Optional	conduct cleaning tasks	

			BG
		EQF level	4
Category	KSC_ RelationType	Volume of additional LO KSC	high
Category	Cluster	TSC skills concept	
Language skills and comp.	[individual language]	mother tongue	
		foreign language	
Life skills and competences	Adopting environmentally friendly practices (Environmental literacy)	follow environmentally-sustainable work practices	
	Digital skills and competences	digital communication and collaboration	
		ICT safety	
		problem-solving with digital tools	
Working with computers	digital content creation		

			BG
		EQF level	4
Category	KSC_ RelationType	Volume of additional LO KSC	high
Self-management skills and competences	Acting according to values	follow ethical code of conduct	
		support company plan	
	Acting independently and showing initiative	work independently	
		identify opportunities	
		demonstrate curiosity	
		demonstrate enthusiasm	
	Dealing with change	adapt to change	
		deal with uncertainty	
	Engaging in self-development	demonstrate willingness to learn	
	Managing negative factors in life and work	manage frustration	
		cope with pressure	
		persist	
	Responding to routine requirements of tasks	follow hygienic work practices	
		follow safety precautions in work practices	
		attend to hygiene	
		attend to detail	
work efficiently			
make an effort			
Social and communication skills and competences	Collaborating with others in teams and networks	interact with others	
		work in teams	
	Conciliating and negotiating	negotiate compromise	
	Conveying and exchanging information and ideas	report facts	
		use body language	
		manage quality	
		use questioning techniques	
		communicate mathematical information	
	address an audience		

			BG
		EQF level	4
Category	KSC_ RelationType	Volume of additional LO KSC	high
	Managing and leading others	instruct others	
		persuade others	
		motivate others	
		lead others	
	Showing respect and consideration for others	demonstrate consideration	
		demonstrate good manners	
		demonstrate intercultural competence	
		support cultural diversity	
		accept constructive criticism	
	Supporting others	support gender equality	
		give advice to others	
Thinking skills and competences	Acquiring and organising information	support colleagues	
		manage quantitative data	
	Adressing problems and issues	memorise information	
		make decisions	
	Analysing and processing information	develop strategy to solve problems	
		carry out work-related measurements	
		evaluate information	
		digital data processing	
		carry out work-related calculations	
		process qualitative information	
	Creating and innovating	use mathematical tools and equipment	
		work with shape and space	
	Planning and organising	think creatively	
		apply quality standards	
		manage time	
		use learning strategies	

DK	IE	ES	FR	LT	NL	AT	FI	UK-EN	
4	4	3	3	3	3	n/a	4	3&4	
low	none	none	low	none	medium	high	high	none	
									7
									5
									4
									2
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									5
									5
									3
									2
									4
									8
									6
									4
72	62	63	55	45	91	75	106	54	

Table A10. **Core learning outcomes identified based on the mapping of healthcare assistant qualifications to the ESCO occupational profile (p. 105)**

ESCO – new structure		
Level 1 title	Level 3 title	KSC label
Attitudes	Apply quality standards	comply with quality standards related to healthcare practice
Values	Demonstrate consideration	empathise with the healthcare user
Communication, collaboration and creativity	Coordinating activities with others	communicate with nursing staff
	Providing medical advice	interact with healthcare users
	Listening and asking questions	listen actively
	Working in teams	work in multidisciplinary health teams
		work with nursing staff
	Following instructions and procedures	work under supervision in care
Assisting and supporting co-workers	support nurses	
Information skills	Monitoring health conditions	identify abnormalities
		monitor basic patients signs
Assisting and caring	Providing support to resolve problems	support individuals to adjust to physical disability (optional skill/competence)
	Complying with health and safety procedures	ensure safety of healthcare users
		comply with legislation related to health care
	Complying with legal and organisational guidelines	adhere to organisational guidelines
Assisting with personal needs	provide basic support to patients	
Management skills	Planning and scheduling events and activities	apply organisational techniques
Knowledge	Medical diagnostic and treatment technology	sterilization techniques (optional knowledge)
	Care of the elderly and of disabled adults	disability types (optional knowledge)
		disability care (optional knowledge)

ESCO – new structure		
Category	Cluster	TSC skills concept
Self-management skills and competences	Responding to routine requirements of tasks	follow hygienic work practices
		follow safety precautions in work practices
		attend to hygiene
	Acting according to values	follow ethical code of conduct
Social and communication skills and competences	Collaborating with others in teams and networks	interact with others
		work in teams
	Conveying and exchanging information and ideas	report facts
		use body language
	Supporting others	give advice to others



Comparing vocational education and training qualifications

Towards methodologies for analysing and comparing learning outcomes

This report brings together the findings of the Cedefop project *Comparing vocational education and training qualifications: towards a European comparative methodology*. Looking into the challenges related to the in-depth analysis and comparison of the content of VET qualifications, the report provides a methodological basis on which both researchers and policy-makers can build.

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